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Vol. 2 October 2, 1912 No. 1

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RATE RESEARCH

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PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

NATIONAL ELECTRIC LIGHT ASSOCIATION
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120 WEST ADAMS STREET · CHICAGO, ILL.

Rate Research

Issued Every WEDNESDAY by the RATE RESEARCH COMMITTEE
120 WEST ADAMS STREET - CHICAGO

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Rate Research

Vol. 2. CHICAGO, OCTOBER 2, 1912 No. 1

EDITORIAL

In November, 1911, the desirability of collecting all available rate information was recognized by the Rate Research Committee, and at that time plans were made to compile and print such data as a supplement to the annual report of the Committee. After the office of the Committee was opened in Chicago, such information accumulated rapidly, and inquiries were received from some of the Member Companies as to the latest rulings of commissions on certain matters relating to rates. It occurred to the Committee that the information as it was coming into its office, and as gathered together to answer questions, had an immediate value and might be of general service. So in a rather informal way, the Rate Research Bulletin was started, the first number going to about twenty-five of the Member Companies.

Without any attempt to increase the circulation, the mailing list soon grew to the absolute limit of the method of reproduction, and when the attempt was made to stretch this a little to meet the demands, complaints were frequently made as to the illegibility of the copies as sent out to the companies.

In July, the Executive Committee of the National Electric Light Association authorized the Rate Research Committee to print the bulletin as a regular weekly publication of the Association. With this, the first printed number, the beginning of Volume Two, the name of the publication has been changed to RATE RESEARCH.

Technology Library Fund Pgh. Soc. A. C. S.

In the beginning there was no thought of a serious publication, but as the peculiar field that the Bulletin covered was examined and talked over with electrical publishers, it was found, that while many of the technical papers were taking excellent care of some parts of the field covered, there was no single reference periodical which attempted to gather together all of the rate information as it particularly applied to electric companies and present it in such form that the companies could readily acquaint themselves with all of the essentials of current rate and rate regulation information.

The big basic principles of the National Electric Light Association are co-operation and efficiency, and the Rate Research Committee, in sharing Rate Research with those interested in electrical rate matters, looks for a hearty co-operation in the supplying of news, and in criticism and constructive suggestion, in the belief that eventually there will be developed a co-operative paper which will give to all interested, a correct impression and understanding of the trend of modern rate regulation.

The subscriptions to such a paper must necessarily be limited, but this should result in closer and more confidential relations between the Committee and the subscribers. Every Member Company of the National Electric Light Association should appoint a Member Company Assistant to the Rate Research Committee, and with such assistants in actual touch with the local rate situation, from one end of the country to the other, there is no reason why the field should not be thoroughly covered, and here again co-operation will count for much.

And now as to the form of articles that will appear in Rate Research. All important court and commission decisions will be abstracted from the full reports, giving first: a short history of the case, and second: direct quotations from the important paragraphs that have a bearing on matters influencing electric rates. Reference to current rate informa-

tion, as soon as it appears, will be carefully noted, and with such explanation and description as will indicate, as far as possible, the value of the particular article for reference purposes. If a copy of the original paper has not been received by the Committee, a short abstract only will be made, and the reference will be designated to show that a more detailed abstract, made directly from the original, will be given in a later number of RATE RESEARCH.

The Committee believes the RATE RESEARCH issued weekly and containing the actual news as to current rate events, will be more useful to the Member Companies than a compilation of public service laws and decisions, which could only be issued at long intervals, and would be soon out of date. The Committee will make the attempt to collect in its library any compilations of such laws and decisions as are made by other associations, and these will be kept up to date, so that the latest information will always be available to the Member Companies.

One of the most helpful indications as to desirable original articles for publication, is derived from the inquiries of Member Companies as to problems coming up in the daily rate situations as they occur in each locality. The Committee especially invites such inquiries. Often the answer can be prepared only after an extended investigation, but such data when prepared usually contains information of great general value.

In any collection of rate or rate regulation information, one of the most difficult problems is the proper filing or indexing of the data received. Perhaps no two persons will agree as to the relative importance or proper place for various items of information, and the Committee has at this time prepared a tentative classification, which it is hoped will be gradually developed both as a method for quick reference to rate data, and as a proper indication of the general scope of the information to be covered by RATE RESEARCH.

RATE RESEARCH COMMITTEE

A New Member. President Tait has appointed Frank W. Smith, Vice-President of the United Electric Light and Power Company, of New York City, to take the place of Arthur S. Huey, resigned.

Street Lighting Data. On August 31st, the Rate Research Committee sent out to the Member Company Assistants a comprehensive blank to be filled in with general statistical data, to aid the Committee in a study of a proper basis for street lighting rates. The returns from these blanks are now being received and the information is extremely important and interesting.

Rate Schedules. Following the suggestion contained in the 1912 Report to the Seattle Convention, the Rate Research Committee on September 14th sent out sample forms of rate sheets to the Member Company Assistants, together with blanks requesting that such companies send to the Committee a tentative schedule of existing rates for criticism and advice.

Next Committee Meeting. A meeting of the Rate Research Committee will be held at Boston on Friday and Saturday, October 4 and 5, at which time plans for 1912-13 will be discussed.

ABSTRACT OF DECISIONS

131—CONFISCATORY RATES—DES MOINES GAS CASE

Complaint of DES MOINES GAS CO. vs. CITY OF DES MOINES and others, an opinion and decision dated August 21, 1912, in the District Court of the United States, Southern District of Iowa. Smith McPherson, Judge.

History of Case. The gas rate in Des Moines was lowered by a series of reductions in the past few years from $1.30 to $1.00 per thousand. The City Council, by ordinance of December 27, 1910, fixed the rate at 90 cents, whereupon the present action was brought by the Gas Company to enjoin the enforcement of the ordinance, alleging that a 90 cent rate would not be remunerative. The case was referred to Judge Robert E. Sloan as Master, who spent nearly a year upon it, and reported that a 90 cent rate was high enough to insure a sufficient return to the Gas Company.

29—**State Regulation.** The ordinance was adopted by the City Council

"within a few minutes of its introduction . . and without the presence of any one for the Gas Company. And every member voting to reduce the earnings had a direct personal and moneyed interest in thus reducing the rates. If a judge were to so act, his acts would be absolutely void, because of the long time maxim 'No man can be judge in his own case.' . . This litigation has cost the gas company and city extravagantly large sums, most of which cannot be taxed as costs, nor recovered back by the party successful in the end . . and . . would be avoided if Iowa . . had an impartial . . commission or tribunal with power to fix these rates at a public hearing, all interested parties present, with the tribunal selecting its own engineers, auditors and accountants. Too often we have selfish, partisan, prejudiced and unreliable experts engaged for weeks at a time, at $100 or more and expenses per day, exaggerating their importance, and making the successful party in fact a loser. With all of our boasted advancement, Iowa is a laggard in this matter, and will continue as such until these rate makings are taken from the power of city councils. Appeals to the courts will seldom be taken from the findings of [a state commission.]"

315—**Good Will**

"The 'good will' and that which the corporation enjoys as being the only source from which gas can be obtained, is not an element of value on which profits should be earned in estimating whether the rates are remunerative or confiscatory."

34—**Rate of Return**

"The net earnings, according to the duration of the franchise, the earning power of money in that vicinity, the hazards, moral and physical and otherwise, should vary from four to eight per cent beside that set aside for depreciation and maintenance. But there is and can be no rigid or inflexible rule as to the per cent to be thus earned:

Stanislaus County vs. San Joaquin Company..192 U. S. 201–216
Knoxville vs. Knoxville Water Company . 212 U. S. 1
Willcox vs. Consolidated Gas Co. . . . . 212 U. S. 414
San Diego Land Company vs. National City..174 U. S. 739
Lincoln Gas Co. vs. City of Lincoln. . . . . 223 U. S. 349
Cedar Rapids Gas Co. vs. Cedar Rapids. . . . 223 U. S. 655

51—**Basis of Rate**

"All concede that the present value is the basis on which returns are to be estimated. And with the findings of the Master on that matter there are but two matters which merit consideration. And on these two questions [Reproduction Theory and Going Value] the great weight of the argument by counsel has been made."

311—**Paving Over Mains.** Twenty-one per cent of the streets in which the mains are located have been paved since the mains were laid, the additional cost of reproducing the plant due to this fact, the item of taking up and replacing such pavement, would amount to $140,000. The inclusion of this sum as forming part of the value of the plant would rest only on theory,

"and to increase the capitalization now to the extent of $140,000 is to allow such gas rates as will pay a dividend on such sum from and after this date. But the sum of $140,000 is not put in the capital or value account until the

plant is reproduced." The inclusion of this sum therefore would be "illogical and against facts, and was properly denied by the Master."

311—Reproduction Value

"It is claimed the true value of any building, structure or plant is that sum which it takes to reproduce it less the depreciation. . . . But the question is as to its value today with reference to income. What it may have cost is pertinent. What it will sell for is to be considered. And, if destroyed by any agency, such as rust, crystallization, or other forces, what must be paid to reproduce it is a subject of inquiry."

Following the Master's method of considering all these evidences, the valuation of $2,240,928 was approved.

315—Going Value

"The Master finds that the 'going concern' value of the plant is $300,000, but the Gas Company, by its exceptions, contends that this sum is not in the total of items making $2,240,928. . . A 'good will' value, and a 'going concern' value, are often confused and used interchangeably, and I am inclined to believe that in some instances the Master's report is subject to this criticism. . . . The item of $300,000.00 for 'going value' is quite important in this case. It is contended that if this $300,000.00 must be added and the consumption of gas remains the same, and the percentage of dividends allowed by the Master should stand, there will then be a shortage. The authorities already cited, and which in my opinion are in accord with good sense, favor the allowance of a 'going value.' Every kind of business, with no exception, has a value known as 'going value,' and such 'going value' is in no way connected with the monopoly or 'good will' value. The Gas Company contends that this 'going value' of $300,000.00 was erroneously omitted by the Master in his totals, while the city contends that the sum of $300,000.00 had already been considered in making up the grand total of $2,240,928. I am of the opinion that the contention of the city is a correct one."

The exceptions are overruled, the decision affirming that this going value is included.

33—Working Capital

"If the question were now for decision, I would have much doubt as to the item of working capital, $140,000.00. The Master was liberal with the Gas Company by allowing that item. I fail to find satisfactory evidence in this tremendous record, as to that item, although there is evidence bearing thereon. But every business man knows that the Gas Company daily makes deposits, and daily checks out for expenses, and at stated periods for interest on its bonds, and for dividends. Whether it receives interest on its daily balances, does not appear, nor does it appear whether it must pay interest on its overdrafts, if it has such. And, if it has on hand $140,000.00 as working capital, why such sum would not earn interest is not made to appear. I only mention this to show that the Master has not borne down on the Gas Company."

Decree—Orders the complaint of the Gas Company dismissed with costs, the 90 cent rate to become effective in 60 days, but that after a three years' trial, the case may be re-instated on motion of the Gas Company.

Editor's Note—This case has several unusual features. The Des Moines Gas Company is owned by the United Gas Improvement Co. of Philadelphia and the case of the Company was most carefully prepared. The treasurer of the United Gas Improvement Co. devoted his entire time to the hearings before the Master, and such well known experts as Randolph, Lea, Baehr, Hagenah, Alvord and Almert, testified for the Company. On the other hand, Bemis and Marks testified for the city.

Judge McPherson recently handed down a decision in favor of the Des Moines Water Company, 192 Fed. 193, which was extremely favorable, from the Company's standpoint, as he definitely approved going value, and allowed an 8 per cent return to the Water Company.

A careful examination of the report of the Master leads to the conclusion that it was originally written in favor of the Company, but that, at the last moment, under the influence of the Cedar Rapids decision of the Supreme Court, quoted above, he reversed his decision in a concluding section, without changing the body of the report.

While no motion has yet been made, it is expected that this case will be appealed to the United States Supreme Court.

A Binder for Rate Research

The Committee has considered that subscribers may wish to bind their copies of "Rate Research" in order that a complete file can be maintained, and after going over several standard binders in general use, recommends the Grip Individual File, No. 300 S, manufactured by the Cooke and Cobb Company, Brooklyn, New York. This is a well made file which may be obtained from any local stationer: stout paper backs 15c, cloth 50c or leather 65c.

RATE RESEARCH CLASSIFICATION TENTATIVE OUTLINE

MAIN CLASSES

1. **PUBLIC SERVICE**
2. **PUBLIC SERVICE REGULATION**
3. **ECONOMIC & FINANCIAL**
4. **TECHNICAL**
5. **RATE THEORY AND DEVELOPMENT**
6. **RATE PRACTICE**
7. **SERVICE**
8. **MUNICIPALITIES**
9. **COMMERCIAL AND GENERAL**

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CURRENT REFERENCES

19—General History.

Lighting Developments During the Nineteenth Century. An abstract of an article in "Good Lighting," by Roscoe Scott. Electrical Record, 3 pages, September 1912, page 139.

A good summary of the progress of lighting, gas and electric, by decades, from 1800 to 1912.

315—Intangibles.*

Intangible Values of Electric Lighting and Power Properties. A paper by William J. Hagenah, formerly Chief Statistician of the Wisconsin Railroad Commission. Portland Convention of the Northwest Electric Light and Power Association, September 11-14, 1912.

Development of Regulation, leading decisions of Courts and Commissions, evils of competition, and the claim that public utilities should receive credit for costs incurred in developing business.

42—Measurement of Demand.*

Instrumental Methods of Measuring Maximum Demand, a paper by T. I. Jones and W. Eichert. Hot Springs Convention, Association of Edison Illuminating Companies, Sept. 10-12, 1912.

Methods, instruments and time interval, and its effect upon the rate schedule.

453—Load Factor.

A Study of Load Factors, by S. A. Fletcher. "The Electric Journal," 7 pages, September, 1911, page 773.

Giving load factor and cost data for small stations.

6—Rate Practice.*

Justification of a Rate. A paper by D. C. Barnes. Portland Convention of the Northwest Electric Light and Power Association, September 11-14, 1912.

Discusses rate methods, factors, methods of estimating, and contains statistics relative to rates in various cities in the Northwest. Mr. Barnes states that a careful analysis should be made to determine whether rates charged for different classes of service yield a reasonable return upon the fair valuation of the property employed.

621—Small Lighting. *

Is Residence Lighting Profitable. A paper by O. B. Snyder, Portland Convention of the Northwest Electric Light and Power Association, September 11-14, 1912.

Calls the attention of electric companies to the desirability of investigating a number of problems relative to residence lighting.

72—Special Service Charges.

The Minimum Charge, a paper by Judge S. M. Douglass, presented before the Ohio Gas Association, abstracted in "The Gas Industry," 1 page, September, 1912, page 555.

This paper defends the minimum charge for gas rates and explains the difference between the minimum and meter charge, the latter being illegal in Ohio. The paper also opposes the free installation of service beyond the curb.

755—Meters.

Watt-Hour Meter Seal. Description of Watt-Hour Meter Seal, manufactured by the Palmer Electric & Manufacturing Co., Boston, Mass. Electric World, ½ page, September 28, 1912, page 677.

Claimed—that it is impossible for an unauthorized person to replace this seal without committing forgery.

91—Promotion of the Business.

Motor Drive in Candy Factories. Motor Drive Series—Article No. 11—Electrical Record, 2 pages, September, 1912, page 155.

A short description of the equipment in three candy factories.

95—Progress in the Art.

Generating Energy at Coal Mines. The Chignecto Plant of the Maritime Coal Railway & Power Co., Ltd., of Amherst, Nova Scotia; the pioneer installation for generating electrical energy from waste fuel at the pit mouth. Electric World, 4 pages, September 28, 1912, page 655.

A technical description of the plant, transmission system, load and operation.

92—Progress in the Art—Gas Producers.

The Status of the Gas Producer and of the Internal Combustion Engine in the Utilization of Fuels. A 39 page paper by Robert Heywood Fernald, issued by the Department of the Interior, Bureau of Mines, Technical paper 9, 1912.

This paper contains sections upon fuels tested, the source of producer gas, its application, the capacity of producers, and a brief statement of recent development in the United States. Internal combustion engines are treated at length including the Diesel and Junker's engines and also their reliability, and the utilization of the waste heat of the gas engine.

On page 35 is a special section relative to the Diesel engine in Central Station work which gives a brief account of a paper presented at the Municipal Electrical Association in Brighton, England, as to the relative cost of a 10,000 kilowatt installation for steam turbines, gas producers and Diesel engines, and in which the author's figures were decidedly in favor of the Diesel engine installation. Attention was also called to the very economical use of these engines as a substitute for sub-station converting machinery. Such stations are already appearing in England.

In conclusion the author states "It is gratifying to note that each year gives evidence of the absurdity of many of the prophecies regarding the elimination of practically all prime movers save the internal combustion engine and that the past year may be regarded as one of steady conservative progress, and development in this field."

91—Promotion of the Business.

Electricity in Cooper Shops. "Electrical Review and Western Electrician," 5 pages, September 28, 1912, page 583.

The article discusses operating conditions in typical cooper shops, pointing out the field for improvement, reasons for individual motors, and complete data concerning several plants.

*Articles marked with a star will be abstracted in a later number of Rate Research.

Vol. 2 October 9, 1912 No. 2

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Rate Research

Vol. 2. Chicago, October 9, 1912 No. 2

EDITORIAL

The Rate Research classification given on page 10 of the last issue has been arranged to purposely include all matters that might have an influence upon rates or that might be considered in a rate determination.

The Committee finds that there are two distinct viewpoints as to electric rates. One is the study of rates, per se, without regard to the value of the plant and a proper return upon such investment; and the other is the more comprehensive subject involving all of rate regulation and any factor or influence which might affect rates in any way.

The Rate Research Committee itself expects to devote its attention in 1912-13 principally to Section 4, Technical; Section 5, Rate Theory and Development, Section 6, Rate Practice, and some attention to Section 7, Service; as outlined in the tentative classification. In order that this will be fully understood and easily noted, all reference numbers to such sections will be printed in bold face type and all other references in light type.

The Committee however, believes that the Member Company Assistants now preparing their companies and themselves to fully understand the rate questions of today, will wish that all references be given in Rate Research, so that with the aid of the classification numbers, such Member Company Assistants can follow up the information that will be of greatest assistance in solving their local problems.

RATE RESEARCH COMMITTEE

The meeting of the Rate Research Committee was held in Boston, Friday and Saturday, October 4th and 5th.

Most of the time was occupied by a careful analysis of the tentative schedules submitted by over twenty of the Member Companies, and the Secretary was instructed to prepare standard descriptive matter for the various sections of the rate table, which could be recommended to the companies for their general adoption. The Secretary was also instructed to return the schedules submitted, with a letter explaining the proper use of the uniform descriptive matter as recommended by the Committee.

The next meeting of the Committee will be held in Chicago on Tuesday and Wednesday, November 19th and 20th, at which time the Committee will devote its attention to a consideration of the Cost of Service theory, and the Value of Service theory, as applied to electric rates.

NEW RATES

625—Feature Rates. The Edison Electric Illuminating Co. of Boston has made effective as of October 1st a Miscellaneous Energy Rate as follows:

Character of Service.—Available for energy used for the following purposes only: Charging Storage Batteries, Cooking, Heating, Electroplating, Refrigeration, Water Supply and Irrigation.

Rate.—Meter rate with quantity discounts.

The first 20 kilowatt hours of monthly consumption at 10 cents.

The next 1,980 kilowatt hours of monthly consumption at 3 cents.

Discount.—If the customer agrees to pay a price of 10 cents per kilowatt hour for all electricity furnished under this agreement, that is used in certain hours specified from time to time by the company, but not exceeding 500 hours during the year, and not exceeding four hours during any day, this amount to be a separate charge independent of the kilowatt hours billed at the short rates, an additional discount is allowed, as follows:

Excess over 2,000 kilowatt hours of monthly consumption, 2 cents.

The customer agrees to pay $5.00 per month for necessary graphic instrument if bills are less than $100 per month.

Minimum Charge.—$12.00 per year per meter.

629—Breakdown and Auxiliary Service. The Edison Electric Illuminating Co. of Boston has reduced its minimum charge for breakdown or auxiliary service from $3.00 per kilowatt to $1.00 per kilowatt per month effective October 1st.

This charge is based on the setting of a circuit breaker so that if the customer exceeds the service he is paying for, his service is disconnected. He may use electricity at any of the regular rates up to the minimum without further charge. If the customer exceeds the minimum, the electricity is billed at the regular rate applicable in each case.

ABSTRACT OF DECISIONS

626—Street Lighting Rates—Worcester

Complaint of the MAYOR of WORCESTER of the price charged by the WORCESTER ELECTRIC LIGHT COMPANY for street arc lights. Dicision of the Board of Gas and Electric Light Commissioners, Massachusetts, July 10, 1912.

History of the Case. Since 1906, the Company has supplied 4-ampere magnetite arcs, burning all night and every night, on an average over ten hours per night at $91.25 per lamp per year. The Company has adopted within the last three years a liberal policy, and greatly increased its commercial business and improved its capacity and service, making many substantial changes in its price schedules to the public. The Company and the City agreed that their rates should be determined on the basis of cost but disagreed in the method of applying such theory. The Board rejected the Cost of Service theory as laid down by both the Company and the City as a basis for the fixing of rates in this case.

Recommendation of the Board. That on and after September 10, 1911 the price of 4-ampere magnetite street arc lamps burning all night and every night, so long as not less than 900 lamps are supplied, shall be not more than $80.30 per lamp per year.

51—Cost of Service Theory of the City's Expert

This engineer, "in the absence of a detailed appraisal of the Company's property . . aided by his own knowledge and experience, assumed, from certain figures in the company's books, in its return to this Board, and in its exhibits to support its applications for stock, that the company's investment for street arc lamps in Worcester amounted to approximately $300,000, . . upon this amount he allowed a return of 5 per cent and 7 per cent more for depreciation." Similarly he determined the "operating cost of the necessary electricity delivered at the lamp terminals . . the total yearly consumption of electricity by the arc lamps . . certain other items of expense incurred exclusively in this service . ." adding these amounts, "and dividing the sum by the average number of lamps in use during the year, a price of $64.83 per lamp per year was found."

51—Cost of Service Theory of the Company

The fixed investment for municipal arcs was figured as that proportion of total investment equal to the ratio of municipal arc connected load to generating capacity of the station; next the value of all municipal arc property by detailed inventory was added, and 6 per cent return allowed on this sum, with 5 per cent more for depreciation; operating expenses and taxes were similarly figured, the charges incurred exclusively for municipal arc operation added, and the total sum divided by the number of lamps supplied, giving $91.94 as cost per lamp per year.

5—Rate Theory of the Commission

The Board rejected the cost of service theory as basis for fixing rates in this case, holding it to be "impracticable under present conditions to make an analysis and apportionment of the company's property and operations so accurate and conclusive as to be the controlling factor in fixing the price for the municipal arcs . . The municipal arc system is operated as an integral part of the company's entire plant . . is neither a separate nor readily separable part of the company's business." The Board therefore fixed the rates by a comparison with prices charged to the other customers, and a consideration of the total profits of the company's business.

"The Company's customers may be broadly divided into two groups, those who are dependent on the company for their supply, and those who may readily supply themselves in other ways or by other forms of power. To the first the company may dictate the price, controlled only by motives of business expediency, its own sense of justice, and its duty as a public servant. To the second the company must so fix the price as to secure the customer's business or else go without it."

"The company claimed that it was its purpose in the near future to make a readjustment of its incandescent lighting rates to private consumers, and that this should be done first."

The Board believes that it would be unjust, by a reduction in the price for municipal arcs, to shift the city's burden for lighting its streets to the private customers of the company, and in the price named has been governed by this consideration."

34—Rate of Return

"For several years the company has paid regularly a dividend of 10 per cent," and as an examination of the entire business of the company shows that the income "is more than sufficient to provide for all reasonable operating expenses, including a proper allowance for depreciation and a fair and even liberal return, there is every reason why a reduction in price can and should be made," and this being so, the customers in the first class, those dependent on the company for their supply, should also benefit by the lowering of rates.

32—Obsolesence

"This company has had experience common to electric light companies throughout the State. It has constantly been compelled to scrap apparatus while comparatively new, because it had become inadequate, or been superceded by more economical or efficient types."

FAMOUS RATE PAPERS NO. 1

51.—Cost of Service Theory.

On the Cost of Electric Supply. From Original Papers, Vol. I., by John Hopkinson. Presidential Address to the Junior Engineering Society, England, 1892. [From the Transactions of Junior Engineering Society, Volume III., Part I., pp 1-14.]

Introduction.—When it has been my lot to address engineers, I have usually directed attention to some scientific point which I thought would be of interest to them. This evening I should like to go to the other extreme and deal with a purely commercial question, with a matter into which no science enters, and which relates entirely to pounds, shillings and pence.

Apportionment of Expense.—You are all of you familiar with the fact that the expenses of an undertaking may be broadly divided into two classes. On the one hand there are expenses which are quite independent of the extent to which the undertaking is used, and on the other, expenses which are absent unless the undertaking is used, and which increase in proportion to the use. For example, the charges for interest on the construction of a bridge are the same whether that bridge is used much or little or at all, and the cost of maintaining the bridge is also practically independent of its user. The same is true in a large measure of a harbor or a dock. Such undertakings lie at one extreme of the scale. It is less easy to find good examples at the present day of the other extreme, as nearly all undertakings with which engineers have to deal require the employment of some capital, and there will be a fixed charge for the use of that capital, and for maintaining against the assaults of time the things in which the capital is embodied. But we can readily see, for example in the case of a cotton mill, that if, on the one hand there are expenses of interest and dilapidation which are independent of the amount of yarn actually manufactured in a given factory, there are other expenses for material and labor, and even for actual wear of machinery, which will be very nearly proportional to the output. Undertakings vary enormously in the proportion of these two classes of expenses; in some the expense is quite independent of the extent of the user, in others it is for the greater part proportional to the user.

Time of Service—Peak Load.—But undertakings differ from each other in another respect. In some cases, the service which the undertaking is designed to render can be performed at a time selected by the undertaker; in others, at a time selected by him to whom the service is rendered. In the case of most manufacturers, it matters not if the thing made is made to-day or to-morrow, in the morning or the evening, for it will not be used for a month hence, perhaps; the thing can, in fact, be extensively stored and kept till it is wanted. Other services must be rendered at the moment the person served desires. For example, the Metropolitan District Railway must be prepared to bring in its thousands of passengers to the city at the beginning of the day, and to take them back in the evening, and for the rest of the day it must be content to be comparatively idle. In this case the services cannot be stored. The line must be of a carrying capacity equal to the greatest demand, and if this be great for a very short time the total return for the day must be small in comparison with the expense of rendering the service. In such a case it would not be inappropriate to charge more for carrying a person in the busy time than in the slack time, for it really costs more to carry him.

Load Factor.—Let us see how these considerations apply to the supply of electricity for lighting. Electrical engineers now realize that they have to provide the same plant and no more, to give a steady supply day and night, as to give a supply for one hour out of the 24. They also now realize that if they are to be ready to give a supply at any moment, they must burn much

coal, and pay much wages, for however short a time the supply is actually taken. Indeed, the term "load factor," proposed by Mr. Crompton, is as constantly in the mouths of those who are interested in the supply of electricity, as volt or ampere or horse-power. The importance of the time during which a supply of electricity is used, was so strongly impressed on my mind years ago, that in 1883 I had introduced into the Provisional Orders, with which I had to do, a special method of charge intended to secure some approach to proportionality of charge to cost of supply. Unfortunately the orders of that day all came to naught.

Length of Use.—A supply of electricity must be delivered at the very moment when the consumer chooses to use it, and as long as, and no longer than, he pleases to use it; it cannot be very readily or cheaply stored, and much of the cost of production is the fixed charge for plant and conductors. Furthermore, the Provisional Orders require that the supply shall be available at all hours; hence coal must be consumed, and workmen must attend, though but few consumers are drawing a supply. The service of supplying electricity has, from an economic point of view, a great deal of similarity to the service of providing a breakwater for a harbor. A great deal of the expense is independent of the number of hours in the day during which the supply is used. To put it in another way, the cost of supplying electricity for 1000 lamps for 10 hours, is very much less than 10 times the cost of supplying the same 1000 lamps for one hour, particularly if it is incumbent on the undertaker to be ready with a supply at any moment that it is required.

Influence of Load Factor on Income.—The actual importance of considerations of this kind can only be realized by examining figures. The figures may as well be estimated figures, because the circumstances vary from one neighborhood to another. No criticism of the details of the figures will affect the general character of the conclusion. Let us, then, imagine a station capable of supplying 40,000 16-cp lamps at one time, with mains and spare machinery enough to ensure that the supply shall not fail, and let us see what the charge for running such a station will be: first, on the hypothesis that it is always to be ready to supply the 40,000 lights at half-an-hour's notice day or night, but that the lights are hardly ever actually required; secondly, on the hypothesis, that the 40,000 lights are steadily and continuously supplied day and night. These are the two extreme cases possible. In the former the load factor is nil; in the latter, it is 100 per cent. If the charge is by meter at 8d. per unit, in the former case the revenue will be nil; in the latter it will be £730,000 a year.

Example—Division of Fixed and Output Charges.—We are going to divide the cost of supplying electricity into two parts—a part which is independent of the hours the supply is used, and a part which is directly proportional thereto, and we are going to estimate the amount of each element. It is for the purpose of ascertaining these elements that we consider two quite hypothetical cases—cases which can themselves never actually occur.

Investment Required.—We must first have an idea of the capital outlay required. To provide the maximum of 40,000 lamps we need to deliver 2,500 units per hour, and we may estimate the capital outlay as follows:

Land	£25,000
Buildings	15,000
Boilers and pipes	14,000
Engines	24,000
Dynamos	15,000
Switchboard and instruments	2,000
Feeders and mains	50,000
	£145,000

Annual Charges on Investment.—Let us deal with the annual charge for each item of capital separately on the two hypotheses. The charge for land and for buildings, including repairs, is clearly the same in the two cases, say at 4 per cent, £1,000 for the land, and at 10 per cent, £1,500 for the buildings. The boilers, engines and dynamos will have a charge for interest, and a charge for writing off, or amortization as the French call it, that is, for writing off the value of the plant before the time at which it becomes antiquated—exactly the same in the two cases. The boilers, too, will require exactly the same repairs whether they are merely keeping steam, or whether they are generating steam continuously; but the machinery will certainly require more for repairs and renewals if it is all running, than if a part only is running without load and the rest is standing ready for a load if required. I take 4 per cent as the charge for interest; 3 per cent for amortization; 8 per cent for repairs and maintenance. Of the repairs of engines and dynamos I assume that 2 per cent will be applicable if the plant runs light, the remaining 6 per cent if it is fully and continuously loaded. The expenses connected with conductors and switchboard, etc., will be exactly the same whether the current is passing or not; these I take at 15 per cent. The rates [i. e. taxes] I put down at £500 a year.

The account, then, for the fixed charges already enumerated would stand as follows:

Total Fixed Charges:	Running Light	Fully Loaded
Land	£ 1,000	£ 1,000
Buildings	1,500	1,500
Rates [Taxes]	500	500
Boilers	2,100	2,100
Switchboard and conductors	7,800	7,800
Engines	2,160	3,600
Dynamos	1,350	2,250
	£16,410	£18,750

Output Charges—Fuel.—We now come to a most important item in the account—the coal. There is no doubt that with uniform and continuous load a unit of electric energy—1 1/3 horse-power for one hour—can be produced for less than 3 lbs. of coal; it is also pretty much admitted that with a load factor of about 12 per cent, but continuous maintenance of pressure, the consumption of coal in good practice is something like 7 lbs.; that is to say, to keep the boilers warm, turn round the machinery for 24 hours, and deliver full current for 24 hours, will require 72 lbs. of coal per kilowatt; whereas to keep the boilers warm, turn round the machinery, and deliver current for 3 hours will require 21 lbs. of coal. The boilers being kept warm, it will take 51 lbs. of coal to generate steam enough to give a unit per hour for 21 hours; 58 lbs. to give a unit per hour for 24 hours; subtracting this from 72 lbs., the amount required both to generate steam and keep the boiler warm, we may infer that to keep the boiler warm and merely turn the machinery in readiness to meet a demand will take about 14 lbs. of coal per day for every unit per hour the plant is capable of producing. In 1889, for the Society of Arts, tests were made of a Paxman compound engine, from which it appears that a boiler which when fully loaded consumed 40 lbs. of coal per hour, required 4 lbs. per hour to keep steam up to normal pressure when the engine was standing; that is 10 per cent of the coal used was used to maintain the steam pressure. Remembering that in addition we keep some of our machinery moving, this may be said to confirm the figures adopted. Thus, if the plant runs light all the year round 12,775,000 lbs. or, let us say 6,000 tons of coal will be consumed. If the plant runs fully loaded, 65,700,000 lbs., or, let us say 30,000 tons would be consumed. If we suppose the coal to be best smokeless it might cost 20s. per ton.

Other Output Charges.—Next we have water, oil, and petty stores; say £600 and £3,000 in the two cases. Wages will be a little less if we run light than if we run fully loaded, and of course, will largely depend on local circumstances; let us say £5,000 and £7,500 in the two cases. This gives us substantially all the expenses which have to be met and our account will stand thus:

Total Charge.—

	Running Light	Fully Loaded
Fixed Charges	£16,410	£18,750
Coal	6,000	30,000
Stores	600	3,000
Wages	5,000	7,500
	£28,010	£59,250

Result of Analysis.—Thus the cost of merely being ready to supply 2,500 units per hour at any moment throughout the year will be £28,010, and the cost of actually supplying 2,500 units per hour for every minute in the year will be £59,250. The undertaker, therefore, who incurs the liability to supply, ought to receive £11 per annum per unit per hour, from those on whose behalf he incurs the liability, and if he receives the £11 he need not charge more than 1/3d. per unit for what he actually supplies to cover his expenses. That these figures are fair approximations can be seen as follows: According to this calculation the cost of supplying 2,500 units for one hour per day is £28,010 plus 2,500 x 365 x 1/3d. equals £29,277, and the charge for the service at 8d. a unit would be £30,417; it is doubtful if such a supply would pay. On the other hand, an indicated horse power on such a scale could certainly be supplied continuously for from £12 to £14 per annum, and according to this calculation an electrical horse-power will cost just under £18 per annum. No account is taken of expenses peculiar to companies, such as directors' fees and the cost of forming the company. It will also be noted that it is assumed that accumulators are not used.

Service Rendered Should Bear Some Relation to the Cost.—The charge for a service rendered should bear some relation to the cost of rendering it. If it is a matter of open competition the matter will settle itself, for no one will for long be able to supply some customers at a loss, and recoup himself by exorbitant profits from others. If the matter be a case more or less of monopoly, the adjustment is less certain; thus, the Post Office charges 1/2d. postage for a printed circular, and 1d. for a written letter, the two costing the Post Office exactly the same. What a boon to the public it would be, if the Post Office would charge more for printed trade circulars, which in nine cases out of ten, are a nuisance to those who receive them. The supply of electricity is not quite a monopoly; companies compete with each other, and there is always the competition with other methods of illumination, such as gas and paraffin. It is clearly to the advantage of the undertaker to secure all those customers whom it pays best to supply, and as far as may be, to compel those who are unremunerative to adopt these other methods. The ideal method of charge, then, is a fixed charge per quarter proportioned to the greatest rate of supply the consumer will ever take, and a charge by meter for the actual consumption. Such a method I urged in 1883, and obtained the introduction into certain Provisional Orders, of a clause sanctioning "a charge which is calculated partly by the quantity of energy contained in the supply, and partly by a yearly or other rental depending upon the maximum strength of the current required to be supplied." In fixing the rates of fixed charge, it must not be forgotten that it is improbable that all consumers will demand the maximum supply at the same moment, and consequently the fixed charge named might be reduced, or some profit be ob-

tained from it. There is no object in reducing the cost of electricity for lighting in the case of any customer, much below the cost of equivalent lighting by gas, unless there are competitors in the field willing to do it, hence the current charge proportioned to the power supplied, may safely be increased. In certain recent cases in which I am acting as engineer, the board of trade has sanctioned on my application, "for each unit per hour in the maximum power demanded, a charge not exceeding £3 per quarter, and in addition, for each unit supplied, a charge not exceeding two pence." It is sometimes said as an objection to this method of charge, the public will object to pay a fixed charge whether it makes use of its lamps or not, and that, in fact, it will not pay it. The best answer that can be made is to give everyone the choice of being charged by the maximum simple rate provided by the Order, or by the compound rate as he prefers. What is wanted is not so much an increased charge for those consumers whose lamps are used for a short time, as such a special reduced charge for those whose lamps are used long as will induce them to use the supply.

Comparison With Cost of Gas.—It is instructive to compare the cost to different classes of consumers of electricity and gas for lighting with 16-cp. gas. Flat-flame burners must be large and of first rate quality to give more than two candles per cubic foot of gas per hour; the large majority of burners give much less than this even at their best, and as a rule the pressure of the gas is not regulated, and much gas is wasted as far as the production of light is concerned. Incandescent lamps give about one-quarter of a candle per watt; hence a board of trade unit is equivalent to 125 cubic feet of gas. Thus we readily arrive at the following comparative table, the charge being at the rates recently sanctioned by the board of trade:

Hours of use per annum.	Load Factor	Price of Gas at which cost of lighting by Electricity and 16-candle Gas are equal.
480	5.5	5s.4d.
960	10.9	3s.4d.
1,440	16.4	2s.8d.
1,920	21.9	2s.4d.
2,880	32.9	2s.0d.
3,840	43.8	1s.10d.
7,680	87.6	1s.7d.

In the accompanying curves [not here given] are shown the cost of production, and the charge per unit at the compound and simple rate. The ordinates represent pence, and the abscissae the number of hours per annum the supply is used.

Electricity Economical for Long Use.—It is obvious that those whose user is long, will find the electric light economical to themselves, and that it will be profitable to the undertaker. With a cheap light which is free from the products of combustion there will be extensions for the hours of use. Shops may find it worth while to continue the light after closing, as an advertisement.

Conclusion.—It is possible, indeed probable, that some of my assumed figures may be shown to be too high or too low for the generality of cases. It is of no moment; let each one take any figures he pleases within reason; let him assume that the supply of electricity is made by any system he pleases; he will arrive at a result broadly similar to mine. To be ready to supply a customer with electricity at any moment he wants it, will cost those giving the supply not much less than £11 per annum for every kilowatt, that is for every unit per hour, which the customer can take if he wishes; and afterwards to actually give the supply, will not cost very much more than 3d. per unit.

This is the point I have been laboring to impress, for I take it it is essential to the commercial success of electric supply. It is hopeless for electricity to compete with gas in this country all along the line, if price is the only consideration. But with selected customers electricity is cheaper than gas. Surely it is to the interest of those who supply electricity to secure such customers by charging them a rate having some sort of relation to the cost of supplying them.

[**Note.**—The paper also includes five additional pages using the same figures for all items, but adding storage batteries to the investment, without changing results.]

626—STREET LIGHTING RATES, WAUPACA, WISCONSIN

Joint application of the WAUPACA ELECTRIC LIGHT AND RAILWAY COMPANY, and the CITY OF WAUPACA, that the Wisconsin Railroad Commission act as arbitrator in the claim of the city for a refund on past payments, and a reduction of the contract price, for its street lighting. Opinion and Decision of the Commission June 7, 1912.

History of the Case

The Waupaca Electric Light and Railway Company substituted 6.6 ampere a. c. enclosed arcs, for the 9.6 ampere d. c. open arcs provided for in the contract. The Commission made a detailed valuation of the company's property and cost of operation, and found that the applicant company would not be earning a fair return on its investment if such refund or reduction were made.

Conclusion of the Commission

The city is not entitled to any refund or reduction. The company has substantially performed the contract. While the old type open arcs called for by the contract have greater intensity by about 50 per cent, "the enclosed type is superior as regards uniformity of distribution, as regards steadiness of light, as to glare, and as regards interruptions of service . . . the direct current open arc light has become practically obsolete in this country . . . it appears that the street illumination service of today, involving as it does the general use of the enclosed 6.6 ampere a. c. arc lamp, is a fair equivalent of, if indeed not superior to, the illumination furnished by the older types of arc lamp . . . whatever damage therefore the city may have sustained by reason of the failure of the company to fully comply with the contract according to its express terms is covered by the interest that would now be due the company on unpaid installments of the contract price . . . Under the circumstances, the application of the company for the allowance of interest will be denied. Each party will pay its own costs and disbursements incurred . . . The application for a rehearing is denied."

CURRENT REFERENCES

39—Economic and Financial Information.

The Problem of the Small Electric Light Company. A paper read before the recent convention of the Michigan Section of the National Electric Light Association, by R. S. Stewart, Electrical World, Oct. 5, 1912, p. 715.

The obstacles to good, cheap service in small towns.

19—General History of Electric Utilities.

Thirty years of Central-Station Service in New York City. Electrical Review, Oct. 5, 1912, p. 655.

An illustrated review of the record of continuity of service and business development of the New York Edison Company, from its beginning in 1882 to the present.

95—Progress in the Art.

Three-Car Storage Battery Train. Electric Railway Journal, Sept. 28, 1912, p. 501.

A description of the first storage battery train ever operated, and of general progress in storage battery traction.

74—Safety of Service.

Schwartz v. California Gas and Electric Corporation. Judgment for Complainant and order denying new trial, reversed. Decision by Supreme Court of California, Aug. 31, 1912—125 Pacific Reporter—1044.

An action for injury to a horse from stepping upon a broken insulator, claimed to have been left upon the premises by employees of the Company.

2—Public Service Regulation.

State and Municipal Control of Utilities. An address on the relationship between the two methods, by Mr. John M. Eshleman, President of the Railroad Commission of California, before the National Municipal League. Public Service Regulation, Sept. 1912, page 587.

Mr. Eshleman, in this most suggestive and interesting paper, concedes the theoretical right of municipalities to control corporations operating entirely within the municipal borders, as being in line with the new "generally accepted American doctrine of permitting to localities that degree of self-government which is possible without interfering with the rights of people who do not live within such communities." and then points out that ordinarily telephone, gas and electric light plants, or water works do not so operate, but serve their commodities to outlying communities; and state regulation must be depended upon to secure just and fair treatment of these patrons.

He notes many proofs of the mistakes and wrong doings of municipalities in regulating utilities, permitting second utilities to come in, duplicate service, cut rates below a reasonable scale, and recoup its losses from territory wherein competition does not exist; or drive its competitor out of business, and then recoup itself from the very patrons who have assisted in destroying the competitor. These are practices he declares, that the citizens and authorities of Los Angeles would not be either so selfish or so foolish as to do, but, referring to the claim made by some men there, that because the people of Los Angeles generously and far sightedly went into their pockets to construct the aqueduct, and bring water through the mountains for their use and for the use of much of Southern California, they have not only the legal but the moral right to charge the consumers of this water outside the municipality "all the traffic will bear." He says that this program can no more be justified ethically, than the doctrine of "beating the competition where it exists and soaking the non-competitive points."

Public utilities are nowadays in favor of state regulation, which is a hopeful attitude; and, as compared with municipal regulation, they naturally "view with more approval, one tribunal amply equipped, that shall deal effectively and expeditiously with the problems presented to it, than the annoyance of scores of city councils, each, as I have said, poorly equipped to attack these larger problems." Also "divided authority means duplication of work as many times over as the authority is divided, and from an economical and practicable aspect, it is a waste of governmental machinery to use a half a hundred agencies in doing that which can better be done by one."

Cities are prone to expect their officers to serve for insufficient or no salaries, without suitable equipment for carrying on important detailed and technical investigations, and until cities are prepared to assume the large expense of dealing with the question of regulation as its importance demands, "they should not in justice desire to deal with it at all."

The careless attitude of the cities in this, their inability to determine adequately the questions of rates and service, has often worked injustice to consumers outside the city or upon the utilities themselves, giving us a "moral reason in addition to the very cogent practical reason against dual regulation."

626—Street Lighting Rates.

STREET LIGHTING RATES, by J. R. CRAVATH. Electrical World, Oct. 5, 1912, page 522.

The article states that street lighting rates in this country are very variable and erratic, ranging all the way from $35 per lamp per year, to over $100. Often they are not governed by cost of service, and are even below such cost at times; this policy being found necessary to keep the city from building a municipal street lighting plant, which is further likely to enter into competition commercially with the company, and prove disastrous to the central station, because the tax payers make good all losses on the municipal venture if the municipal rates are too low.

95—Progress in the Art.

Chicago's Latest Generating Station. Illustrated article by H. H. NORRIS, Electrical World, Oct. 5, 1912, page 701.

Commonwealth Edison Company's Northwest Plant, designed for ultimate equipment of 240,000 K. W. Unit system of arrangement of apparatus adhered to throughout, two 20,000 K. W. vertical turbo-generators at present installed, general description of main and auxiliary steam equipment, parking of station grounds.

2—**Public Service Regulation.**

Public Utility Commissions Bills, now Before the People of Colorado, by Virtue of the Initiative and Referendum. A paper by Daniel L. Webb, read before the Convention of the Colorado Electric Light, Power and Railway Association, Sept. 1912, 14 pp.

The paper is a review of the two bills for creating a Public Utility Commission; the first, which has many radical provisions, is proposed to be formed by an amendment to the State Constitution, and gives such wholesale jurisdiction and authority to the commission, and so surrounds its procedure with protection from checks or interference from any source (the jurisdiction of the Supreme Court on appeal to it, being limited to the question of the lawfulness of the Utility Commission's decisions), as to render its power almost absolute, except through the vote of the people, at a great expense, to amend the constitution.

The second bill is more conservative and practical, and though it has some defects, is pronounced "about as good as we could expect under existing political conditions."

91—**Promotion of the Business.**

Electricity in Paint and Varnish Plants. Electrical Review, Oct. 5, 1912, page 631.

This article shows how central station power has effected savings in several plants, the motor load for this business, being made up of long-hour grinding operations, is profitable service.

33—**Capitalization.**

Decision of the Ohio Public Service Commission in the application of Ohio Traction Company to issue preferred capital stock to the amount of $750,000. Denied. Electrical Review, Oct. 5, 1912, page 645, and Editorial, page 627.

The proposed issue was for the purpose of reimbursing the company for a portion of its earnings, which it had expended in improvements and betterments, instead of payments as dividends. There are two entirely different possibilities to be considered in such a case. One is where earnings which might properly be used for reasonable dividends, are diverted for the purpose of extending the property and service of the company, when the issue of stock to that amount would be legitimate; the second is where perfectly adequate dividends have already been regularly paid, and a surplus remains, which may be taken by the Commission to represent the result of excessive rates.

313—**Prices.**

September Prices of Engineering Materials. Price changes and the business outlook. Engineering News, Oct. 3, 1912, page 223.

6—Rate Practice—Express Rates.

In the Matter of Express Rates, Practices, Accounts and Revenues—Opinion No. 1967, Vol. 24. Interstate Commerce Commission, page 379-541.

Contains complete discussion of Express rates, forms and maps. The order requires companies to show cause on Oct. 9, 1912, why the proposed rates should not be put into effect.

75—Adequacy and Efficiency of Service.

Proposed Rules and Regulations for Service Supplied by Electric Light Companies, New Jersey Board of Public Utility Commissioners. 10 pp.

Issued by the Commission for consideration at a conference which will be held at Trenton, on Oct. 16th. Covers, Overhead Line Construction, Regulation, The Grounding of Secondaries. Requires free Carbon Lamp Renewals, Meter accuracy (4% error allowed), and free Meter Tests upon complaint, not oftener than once in six months.

43—Measurement of Energy.

Energy-Cost Meter. Electrical World, Sept. 21, 1912, p. 625.

This meter measures the consumption of current, and at the same time being calibrated to correspond to the central station's price for energy, answers the question, "How much does it cost to operate?" for any energy consuming device.

115—Use of Public Highways.

City of Vernon v. Los Angeles Gas and Electric Corporation. Judgment in favor of the Gas Company; affirmed on appeal. Decision by District Court of Appeal, Second District, California, June 29, 1912. 125 Pacific Reporter, 1084.

An action to enjoin the Los Angeles Gas and Electric Corporation from making excavations in the streets for the laying of gas pipes, and for a mandatory injunction requiring it to remove certain pipes already laid.

129—Default in Public Service.

Reiser v. Edison Electric Illuminating Co. of Brooklyn. Judgment for complainant; reversed. Decision of Supreme Court, Appellate Term, May, 1912. 137 New York Supplement, p. 145.

An action against the Edison Electric Illuminating Co. of Brooklyn to recover a penalty for failure of company to supply current for lighting purposes.

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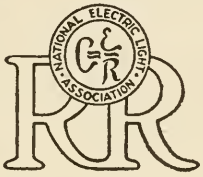
RATE RESEARCH



PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

Vol. 2. Chicago, October 16, 1912 No. 3

EDITORIAL

Do not forget that RATE RESEARCH has been planned as a co-operative paper.

There will be certain items which come to the notice of the Committee which seem important enough to print and send out.

Perhaps other electric rate items come to your attention which seem to be more important. By all means send them in, and let the others have the benefit of your discovery!

As a new paper in a new field the Committee most heartily welcomes criticism; good constructive suggestion and advice will be more than welcome, and as for that other kind—well, the sooner we know our faults the better for all concerned.

NEW RATES

619—Rate Differentials—Minimum Charge.

The Dayton Power & Light Co., Dayton, Ohio, has filed a supplement to its rate schedule, with the Public Service Commission of Ohio, Effective October 7, 1912, in which the Company abandons a former minimum readiness to serve charge of 90 cents per month, for lighting consumers.

The company, after careful consideration, concluded that it was justified in eliminating the minimum charge in order to benefit and encourage the smaller customers.

DR. JOHN HOPKINSON.

Dr. John Hopkinson, whose historic paper *"On the Cost of Electrical Supply"* was reprinted in the RATE RESEARCH for October 9, 1912, was as interesting and distinguished a figure in electrical matters in England as Mr. Edison is in our country. He was two years the junior of the American, and contrasted with him widely, both in formal education and native type of mind, being led as much to pure science as to practical invention. While Mr. Edison, a self-educated man, stands at the head of the class of ingenious inventors who can apply a scientific truth to a practical end, Hopkinson, a Cambridge University graduate, gave as much study to the pursuit of abstract physical and mathematical laws as to their utilization in practice; a great likeness between the two men being in the possessing by both of an immense vitality and energy, and a keen sympathy with the political affairs of their day. The Edison-Hopkinson dynamo was an illustration of Hopkinson's theoretically derived improvements of Edison's construction.

By birth and breeding a North-countryman, Hopkinson was born in Manchester in 1849. His father, who began life as an apprentice in a firm of manufacturing engineers, having become a partner, was enabled to give his son the best of training. In his childhood and youth his visits to the shops with his father strengthened his mind in the course of its natural bent to mechanical study. When fifteen and a half years of age, he entered Owens College, the nearest approach in those days to the technical engineering schools of to-day, and at eighteen he won the Mathematical Scholarship for Trinity College, Cambridge, being first among thirty competitors. During the four years he spent there he captured every prize and scholarship offered in his work, and found time, too, for athletic sports. "On the running path he won several races; he was especially proud of a mile won shortly before his Tripos. * * * He was a good oarsman, and became captain of the Second Trinity Boat Club. * * * He had his full share of the high spirits which are supposed to be the glory of healthy British youth, and many were the escapades into which they led him. In one of them * * * 'sulphuretted hydrogen, a horribly bad smelling gas,' was generated in the next man's rooms, wherefore porters and plumbers came to take up the drains, and the university professor of Latin was driven from his quarters. His conflicts with the authorities were many and various. * * * Against compulsory chapel * * * he

waged unceasing war. * * * He greatly relished his position as a Nonconformist and Radical among the Tory Churchmen; * * * took a simple delight in mildly shocking people. * * * The same spirit often appears in a more serious form in his manner of dealing with scientific questions. It was not only that he was original; he took a positive pleasure in working away from traditional lines, because they were traditional. There is no doubt, for example, that he found additional zest in his magnetic researches, because they showed the elaborate mathematical hypotheses of the subject to be without any basis of fact."

On leaving Cambridge, he went to work in his father's factory, and after a few months spent there to gain practical experience, he began his professional life in a position of much responsibility, as Engineer and Manager in a large firm of Lighthouse Engineers in Birmingham. His success was immediate and lasting. "Even in his first year, when most men would have been content with learning the job and keeping the place going, he introduced change and improvement in every direction," largely increasing the profits thereby.

He inaugurated a new order of things in the management of the workmen, a "system of premiums on work turned out in less than a specified time, and in due course he got piece-work in operation throughout his department. * * * The chief feature which Hopkinson originated in lighthouse practice was the group-flash system."

In 1878 he removed to London for independent practice, where the most lucrative part of his profession became the giving expert evidence in patent suits. In this, "his capacity of drawing the line between fact and argument was that which most distinguished him."

At this time "electric lighting was just emerging from the laboratory and a very limited sphere of application, and had hardly become a commercial question."

Then the invention, by Edison, of the incandescent lamp started the boom, the interest of the public grew rapidly, bringing large capital to the field, with "a demand for the accurate measurement and scientific treatment of the phenomena thus suddenly brought into prominence, and it fell to John Hopkinson to supply this want.

"One is struck by the fact that he, the man fitted above all others for the task by genius and education, came at exactly the right moment for its fulfillment. * * * It is difficult at the present day to imagine the chaos which he reduced to order. The only quantities recognized or understood by the majority of engineers in connection with electrical machinery were the candle power it could produce and the horse power required to drive it. * * *

"In the early part of 1882 the newly formed English Edison Company appointed him to be one of their consulting engineers. The company had been started by Americans with the object of working Mr. Edison's and other inventions in this country [England]. * * *

His advice to the directors of the Edison Company had a great effect in shaping the course of the electric lighting industry. * * * As early as June, 1882, Hopkinson stated the principles which should guide in charging for current. In a report of that date to the Edison Company on the policy which they should adopt in relation to the Electric Lighting Bill, he points out the great importance of the dead charges in central stations and urges the use of a double system of charge, viz., a fixed payment per annum, dependent upon the maximum amount of current demanded by the consumer, together with so much for every unit registered by the meter. This point he continually impressed upon his clients, and he secured power to charge in this way in their early provisional orders. It was not, however, till some years later, in the first stations which he himself designed, that it was actually put into practice. Now Hopkinson's method of charging, with slight variations in detail, is in use in half the stations in the country. Again, he clearly foresaw the impetus which the continuous current would receive on the introduction of a good storage battery, and he constantly urged the Edison Company to push the transmission of power, a great field open to them and at that time denied to their alternating current rivals. * * *

"The first electricity meter, on which he spent a large amount of time and labor, * * * was not a practical success. * * * His work as an inventor was practically confined to the decade 1879 to 1889. During those ten years his name appears in the patent records some five and twenty times, whereas he only took out six patents during the remainder of his life."

In early days his advice to the Edison Company and other clients concerned questions of general policy in electric lighting, with model provisional orders, methods of charge and systems of supply. "But with the spread of these and other ideas there came into being numbers of actual commercial undertakings in electric lighting and power transmission, and as a necessary corollary, the profession of consulting electrical engineer was established. Hopkinson took his place as leader of that profession. He came to be regarded as one whom anyone with an electrical project in hand must consult. Henceforward his professional work consists largely of advice on particular schemes. * * *

In London he was consulting engineer to the Metropolitan Electric Supply Company from its commencement, * * * designed the Manchester Electric Lighting Works," carrying out there several ideas he had advocated for a long time, chief among them being the maximum demand system of charging for electrical supply, which was here adopted for the first time. He "grew tired of making electric lighting stations as their design became stereotyped, .* * * took little pleasure in working on established lines; still less when they had been laid down by himself. * * * In constructive engineering he liked to do one big job of a kind, but did not care about the work of the same sort which would necessarily follow its successful accomplishment. He

had one great desire, and that was to carry out a long-distance transmission of power. It would, he used to say, turn his hair white, but in doing it he would "fulfill the end of his being." It was a dream, the realization of which was probably only prevented by his death. * * * A big project for taking power from the Victoria Falls on the Zambesi came near taking him to South Africa, but was frustrated by the Matabele war."

In 1892 he was appointed to the professorship of Electrical Engineering at King's College, London, where he resumed theoretical and experimental work on a large scale, with great results in the realm of pure research. "There have been few men in whose minds the spirit of scientific research has been so closely associated with the power of practical application as in Hopkinson's." He "took a very active interest in the more general aspects of education." He was the chief influence in establishing a school of engineering in Cambridge.

Some of his inventions were the closed circuit transformer, the series parallel system of motor-control, and, most successful of all, the three-wire system of distribution.

He met his death in 1898, while mountain climbing in Switzerland, while at the fulness of his powers, at forty-nine years of age.

[Abstract of Memoir by his son, B. Hopkinson, from Original Papers by John Hopkinson, Vol. 1, Cambridge University Press, 1901.]

COURT DECISIONS

115—USE OF PUBLIC HIGHWAYS.

EDISON ELECTRIC ILLUMINATING CO., OF WILLIAMSPORT, et al. v. CITIZENS ELECTRIC CO. Judgment in favor of EDISON COMPANY affirmed on appeal. Decision of Supreme Court of Pennsylvania. March 18, 1912. 84 Atlantic Reporter. 438.

Action of the Edison Electric Illuminating Co., which since 1884 has maintained in the streets of Williamsport a system of pole line construction for the transmission of electricity for light, heat and power to persons and corporations within the city and vicinity, against the Citizens Electric Company, which obtained permission by ordinance in 1907, and erected a pole line system throughout the city, that in fourteen different places brought its wires or cross arms within a distance of from 1 inch to 14 inches from the wires of the prior company. The Citizens Company is ordered to remove its construction at those points and in replacing it to give a clearance of not less than 24 inches at all places between its wires and those of the Edison Company.

5—ELECTRIC RATES—WISCONSIN RAILROAD COMMISSION

The latest published report of the Wisconsin Railroad Commission gives the following rulings on electric rates.

122—Just and Reasonable Rates.

Public utilities are business enterprises in which the different parts and branches of the service are, to a considerable extent, dependent upon each other. In the railway service, for instance, there are many branches on which the traffic is not sufficient to carry it. But when this branch is looked upon as a feeder, and the traffic it may furnish for the rest of the system is taken into consideration, it may be found that it is very profitable. If the rates for each branch and main stem were so adjusted as to bear the same relation to the respective costs of the service, there are many instances where the rates of the former would be so high that no freight would be moved under them, while on the main line they would be ridiculously low. Such rates as these would clearly be injurious to both the carrier and the public, and, in order to avoid them, it is usually necessary to be guided by the average cost or conditions, and to make substantially the same rate for the branches where the traffic is light, as for the main line where it is heavy. In the interests of both the public and the carriers, it is usually necessary to treat the system as one unit, and to make the same rate for the same class or kind of service, even if there is some difference in the cost of same. The fact that a carrier may be entitled to reasonable returns upon its business when taken as a whole, does not necessarily imply that each and every part of the service must be equally profitable. What is true for common carriers in this respect is also true, in a way, for other public utilities.

City of Beloit, 1910 ..... 5 W. R. C. R., 632.

31—Valuation.

It is at once apparent that one of the chief factors which influences the determination of equitable rates in the present case is the matter of plant value. Taxes, depreciation and interest on the investment are expenses which a public utility must meet. These are as important as the ordinary expenses of operation or fuel, labor, supplies, etc. Taxes, depreciation and interest on investment are expenses which should be borne by the rate payer or consumer, otherwise the burden of cost does not fall where it belongs. Again, these so-called "fixed expenses" depend directly upon the investment represented in the plant, or, in other words, upon the plant value. It is further apparent that, in order to make each department bear its proper burden of expense, it is necessary to determine upon a fair valuation not only of the total property, but of each department.

Jefferson Municipal El. Lt. & W. Plant, 1910 ..... 5 W. R. C. R., 556.

42—Measurement of Demand.

In the absence of such accurate means for determining the demand as the maximum demand meter furnishes, it is necessary to use some such average value for each of the classes of consumers as experience has shown to be reliable. If, for example, a consumer has a connected load equivalent to twenty 16 c. p. lamps, and 50 per cent. of this is found in practice to be the active connected load, it is safe to assume that ten 16 c. p. lamps represent the average maximum number of lamps that the consumer will burn simultaneously.

Ripon Lt. & Water Co., 1910 ..... 5 W. R. C. R., 36.

453—Load Factor.

Where the customers consist largely of short hour users, there are periods of high instantaneous demand and low load factors. This condition produces high costs per unit and consequently high rates.

Ripon Lt. & Water Co., 1910.....5 W. R. C. R., 89.

As the so-called demand or fixed expense per kilowatt remains the same, regardless of the time the active load is used, it follows from this that the cost per hour must, of necessity, decrease with increases in the hours of daily use. For instance, if it amounts to 9.22 cents per kilowatt hour, for those who use their installation one hour daily, it would amount to only 4.61 per kilowatt hour for those who use the installation two hours daily: for three hours daily use, it would amount to 3.07 cents per kilowatt hour, etc.

Burkhart Milling & El. Power Co.....5 W. R. C. R., 161.

51—Cost of Service.

Rates, to be equitable and just, should be based upon the cost of rendering the service.

Jefferson Municipal El. Lt. & W. Plant, 1910.....5 W. R. C. R., 560.

It is of the greatest importance that the rates be so adjusted that each consumer is made to bear his just proportion of the total cost.

Manitowoc El. Lt. Co., 1910.....5 W. R. C. R., 370.

In the electric utility, time is all important and is the essence of the service. The service must be responsive not only to the instantaneous demand, but to the maximum demand. Since the energy cannot be stored economically, it follows that the utility must have ever ready for service apparatus to meet the maximum demand and such a reasonable surplus as good judgment deems advisable. The same amount of equipment must be installed to meet a half hour full load as where the load is continuous for ten hours. The same principles apply to the sale of gas and water, but to a less degree, since both of these products can be stored for a limited time. These facts have a vital bearing upon the operating expenses and cost of service Since the demand for service is for only a comparatively short period of time, the expensive equipment of the plant is operated only a few hours each day and during the remainder of the time is idle. The buildings and grounds used for housing the plant, the equipment, distribution system and office facilities must all be maintained, even though the use of service is only nominal compared to the capacity of the plant which must be provided to meet the maximum instantaneous demand.

Ripon Lt. & Water Co., 1910.....5 W. R. C. R., 29.

To determine a schedule of rates which will be just and equitable, it is necessary to ascertain the cost of furnishing the service at the particular plant, and to this end the operating expenses must be classified according to their nature. Every consumer, large or small, occasions certain expenses. These are dependent upon his own and the aggregate maximum demand of all consumers, and the amount of current used. In other words, each subscriber must pay his proportion of the capacity expenses, and the cost of the current consumed as shown by the unit variable cost. These amounts can be ascertained only by a separation of the items of operating expenses into the fixed or capacity expenses, and the variable or output expenses.

Ripon Lt. & Water Co., 1910.....5 W. R. C. R., 30.

The capacity of the plant, which is the controlling factor in the determination of the capacity or fixed expenses, depends entirely upon the demand which the consumers may make upon the plant and which it must be prepared to meet instantaneously. This demand is determined by the connected load, which is the sum of the separate loads of the different consumers.

Ripon Lt. & Water Co.. 1910.....5 W. R. C. R., 34.

The output expenses are directly proportional to the current consumed.

Ripon Lt. & Water Co. 1910.....5 W. R. C. R , 42

611—Flat Rates.

Flat rates are, under normal conditions, indefensible in that they do not follow the cost analysis, and they encourage gross extravagance to the great increase of the variable expense of operation without a corresponding income.

Ripon Lt. & Water Co., 1910.....5 W. R. C. R., 34.

612—Meter Rates.

Uniform meter rates are, under normal conditions, indefensible in that they do not follow the cost analysis.

Ripon Lt. & Water Co., 1910.....5 W. R. C. R., 34.

619—Rate Differentials—Minimum Charges.

The operating expense of an electric plant includes several items which vary with or are proportional to the number of metered consumers. The expense of reading meters, maintaining meters, delivering bills, and carrying the customers' accounts are expenses which bear little or no relation to the current sold. These costs go on month by month, whether the consumers use much or little current. Interest, taxes, and depreciation on the investment represented in the meter are expenses which the plant must bear and which it rightly expects to have returned to it. By adding the direct consumer expenses to the fixed charges on the meter investment and also making a sufficient allowance for the current which will be consumed under the minimum bill, the minimum charge may be definitely determined.

Manitowoc El. Lt. Co., 1910.....5 W. R. C. R., 390.

623—Large Light and Power.

It may sometimes be the case that certain large consumers may be given a lower rate, due to the fact that less cost is incurred in supplying such consumers. It may be stated, however, that such reductions in rates should be given only upon careful consideration and with the clear knowledge that such reductions will not compel other and smaller consumers to bear more than their proper share of the expenses, otherwise discrimination must follow such reductions.

Jefferson Municipal El. Lt. & W. Plant, 1910.....5 W. R. C. R., 585.

625—Feature Rates.

There are, no doubt, instances where customers cannot be had at the regular rates, and where it might be good business for the plant, and to the best interest of the rest of the consumers, to make some concession in the rates, at least for a limited period. To put a rate schedule into effect for permanent use, which is so low as to hardly cover the output costs, or that yields so little in the way of revenues as to leave little or nothing for interest depreciation and taxes, would seem to be out of line with sound business practice, and discriminatory as against other customers.

Ripon Lt. & Water Co., 1910.....5 W. R. C. R., 45.

CURRENT REFERENCES

2—Public Service Regulation.

State Regulation of Public Utilities, a paper by Morris Knowles, read before the New England Water Works Association, at Washington, D. C., Sept., 1912, abstracted in Engineering News, Oct. 3, p. 624.

States that the principles of regulation are not new, but inherent in common-law from the earliest days, and points out the advantages of state over municipal regulation.

254—Experts.

The Engineer as Expert Witness, Electrical World, Sept. 21, 1912, p. 600. This is an abstract of a paper in Times Engineering Supplement (London).

The engineer is called on for one of two things, either testimony as to facts within his knowledge, or consulted as an expert, when his relations with the counsel in charge of the case becomes most important, and absolute candor in every particular, even the most damaging, is demanded.

311—Basis of Valuation—Freeport (Ill.) Commission.

A Comparative Study of the Four Principal Methods of Appraising the Value of Public Utilities. An abstract of a report made by the Freeport (Ill.) Water Works Commission, composed of John W. Alvord, F. E. Turneause and A. Marston, Engineering and Contracting, 5 pages, October 2, 1912, p. 368.

The report contains a comparative study on the four principal methods of appraising the value of public utilities, viz.: (1) Original Cost. (2) Commercial or Comparative Method. (3) Value of Plant as found by the market value of its securities. (4) The cost of reproducing the property. Unit prices, depreciation and Going Concern Value are treated at length, with diagrams.

313—Prices.

Cost of Pole-Line Construction. Abstract of a paper read by S. B. Hood before the Convention of the Canadian Electrical Association. Electrical World, Oct. 12, 1912, p. 781.

Gives details and information of value on the cost of distribution systems.

315—Intangibles.

Intangible Values of Electric Railways and their Determination from Accounts, by William J. Hagenah. Abstract of a paper read before American Electric Railway Accountants' Association. Electric Railway Journal, Oct. 9, 1912, p. 698, and discussion, p. 715–17.

An admirable contribution to this most important and difficult question. The method of finding the value of intangibles by an analysis of the company's accounts is clearly and fully described.

359—Sliding Scale.

A Sliding Scale for Street Railway Dividends Based on Quality of Service. Abstract of a paper by James W. S. Peters, read before the National Municipal League, at Los Angeles, Cal., July, 1912. Engineering News, 1½ pages, Oct. 10, 1912, p. 672.

Advocates the appointment of 3 citizens of each city to grade service of street railways, and that return be allowed accordingly. The paper states that the average citizen is more interested in the service than in the fare of street railways.

69—Rate Schedules.

Regulations Governing the Construction and Filing of Utility Rate Schedules. Circular No. 5, 8 pages, issued by the Public Service Commission of Ohio—Approved April 11, 1912.

Gives rules for filing schedules, which must be separate for each utility, defines statutory notice, amending or withdrawing schedules, how printed, size and quality of paper, and form and size of schedule.
By the addition of the P. S C. O. number the form of schedule recommended by the Rate Research Committee, will fully cover all Ohio companies, under these rules.

91—Promotion of the Business.

Some Phases of Central Station Load Building. A paper by E. M. Fay, of Westinghouse Electric and Manufacturing Co., read before the Convention of the Colorado Electric Light, Power and Railway Association, at Denver, Sept. 12–14.

This paper gives very interesting details of methods and results of introducing utility devices into homes and business places. The use of domestic labor saving inventions is solving the servant problen in many places, and is in line with the social evolution of our time.

91—Promotion and Growth of Business.

Central Station Power for Electric Railways in Chicago. A paper by Prof. H. H. Norris. Electric Railway Journal, 3 pages, Oct. 5, 1912, p. 610.

A discussion of the causes underlying the extended use of purchased power, by the electric railways in the City of Chicago. See also descriptive article. Transportation Conditions in Chicago—Electric Railway Journal Convention Number, October 5, 1912, 35 pages, p. 519.

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Rate Research

Vol. 2. CHICAGO, OCTOBER 23, 1912 No. 4

699--COMPARATIVE RATE INFORMATION

THE GRAND RAPIDS-MUSKEGON POWER COMPANY has made a comparison of the rates of 30 cities, from data prepared by the Electric companies in each city, for certain installations. The average rate as shown by this comparison is as follows:

Installation.	Connected Load K. W.	K. W. Maximum Demand.	K. W. H. Monthly Consumption.	Average rate per K. W. H.
Residence, Large.....	3.0	2.2	127	9.1c
Residence, Small	0.6	0.5	27	9.4
Retail Store, Large...	7.0	7.0	1126	6.3
Retail Store, Small...	0.5	0.5	67	8.1
Drug Store	1.5	1.5	200	7.4
Saloon	1.5	1.5	377	6.35
Church	5.0	5.0	156	8.7
Power, 1 motor.....	1.49	2.0	109	6.6
Power, 2 motors.....	3.7	5.0	286	6.0
Power, 8 motors.....	10.3	10.0	244	6.7
Power, 3 motors.....	18.7	25.0	3318	3.2
Power, 20 motors.....	59.7	50.0	4180	3.5

The method of making the comparison was similar to that used by the RATE RESEARCH COMMITTEE in 1911 for certain installations in the 36 largest cities in the United States, but in the above comparison the size of the cities was as follows:

1—Above 1,000,000 people.
4—200,000—500,000 people.
7—100,000—200,000 people.
8— 50,000—100,000 people.
9— 25,000— 50,000 people.
1—Under 25,000 people.

30 total.

COMMISSION DECISIONS.

139—Limitations to Service.

Complaint of the United States Light and Heat Company to compel the Niagara Falls Gas and Electric Company to furnish gas to the United States Company. Decision of the New York Public Service Commission, Second District, Oct., 1912, dismissing the complaint.

The evidence showed that the cost to the gas company to lay the necessary main for this service would be such, that the interest charge on it alone would exceed the yearly return to the company for the gas sold, and as no other customer could be obtained along the route over which the main would have to be extended, the demand for the service was dismissed as unreasonable.

ELECTRIC RATES—MASSACHUSETTS.

The following rulings on Electric Rates have been abstracted from the 24th and 25th Annual Reports of the Board of Gas and Electric Light Commissioners of Massachusetts for the calendar years 1908 and 1909.

12—Protection of the Public.

For that matter, every public service corporation is organized primarily to serve the public convenience, and this fact imposes upon it the imperative duty of enlarging and developing its business in every practicable way, so as to encourage every manufacturing interest it can fairly reach and aid, and to make its rates as low from time to time as is consistent with good service and a fair return to its stockholders.

Worcester El. Light Co.....Mass. G. & E. R., 1910. 60.

12—Protection of the Public.

The use of electricity for light and power has grown with great rapidity during the past two decades, and while it may be generated and used even in small quantities on private premises, yet as a practical matter it is impossible for every individual to manufacture electricity for himself. Most of the members of a community must seek a supply from some common agency, or not enjoy its use. To serve this need, and to promote the public welfare and convenience, the company has been given substantially exclusive privileges to extend its lines throughout the territory which it supplies.

The company has, therefore, a public duty to perform, and is bound to discharge this duty for the equal benefit of all. It is also to be remembered that it has but one service to render its customers, namely to supply them with electricity. The company conceded that it cannot, consistently with its duty to the community, supply A and refuse to supply B, both being within reach of its lines. It is equally clear that to charge A one price and B another for the same service under like conditions is a violation of duty. In a proper conception of the nature of this duty, mere difference in size of customers does not of itself constitute such a difference in conditions as to justify a difference in price.

Edison El. I. Co. of Boston.....Mass G. & E. R., 1909. 43.

112—Franchises.

The provision in the order of the aldermen, limiting the exercise of privileges granted to a fixed term of only twenty-eight years, suggested, we believe, an entirely new departure in the treatment of similar companies in this State. Other States and municipalities have had experience in the granting of franchises for a definite, limited term. Without attempting to fully discuss the important questions involved, we believe it is safe to say that such arrangements neither encourage the highest development of the properties involved not the lowest charges for service, and that they often discourage extensions and improvements; especially in the latter portion of the term. Where the privileges granted the company are not limited as to time, its relations to the public may, in the opinion of the Board, be more effectively regulated and determined as the public interest may seem to demand, by laws and other requirements equally applicable to all companies of that class.

Worcester El. Light Co.....Mass. G. & E. R., 1910. 62, 63.

115—Use of Public Highways.

The Board recognizes the weight commonly given to the argument that the company enjoys valuable privileges in the public streets, granted to it by the city, and that in consideration therefor the company should make concessions to the municipality as a customer. But municipal officers in making such grants are not acting as the agents of the city, but as public officers designated by the Legislature for that purpose. The streets are laid out to serve the general public convenience, and this applies not only to travel over their surface, but to their use for the supply of water, light and sewers. The fact that the power to locate public ways is, to a considerable extent vested in municipal officers, and that their construction and maintenance has to a large extent, been imposed upon the municipalities, gives to the municipalities, or their inhabitants, no peculiar privileges in such ways. The right to erect poles and wires in or under the public streets, cannot be properly granted for the private advantage of the company, but solely to serve the public convenience. Any attempt to charge for this use of the streets, either directly by some form of tax, or indirectly by a concession in price made to the municipality, is virtually, an attempt to shift a portion of the burden of taxation from the taxpayer as such, to the consumer of electricity as such. It is not the purpose of the Board to discuss here the propriety of such a policy. It seems sufficient to point out that this is the fundamental question involved in the position taken by your committee. The Board believes that, in the absence of express legislative sanction, it is not within its province to put into effect by indirection a policy which the Legislature has repeatedly declined to endorse.

Boston School Committee.....Mass. G. & E. R., 1910. 32.

122—Just and Reasonable Charges.

Obviously the value, to this inquiry, of the legal principles stated is negative and not positive. The courts may restrain the enforcement of unreasonable rates, whether established by the company or by public authority. This is the extent of their authority. The scope of the present inquiry is not confined to determining whether or not the present system of rates may be justified because not unlawful. The question of superior importance is whether or not the company's system of rates is, on the whole, consistent with those principles of sound public policy which should govern the relations of the company to the public which it serves.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 34.

132—Protection from Competition—Duplication of Lines.

Such a duplication of electric lines in the public streets of a thickly settled community, would be a serious inconvenience, and a burden not to be tolerated without some distinct assurance of a definite and permanent advantage to the public generally. All previous experience demonstrates the futility of any attempt to secure such advantage in that way. Such a course has ordinarily led to unnecessary waste of capital, and ultimately imposed needless burdens upon the community. Every effort should be made to secure the supply of power at the lowest possible rates, without the evils incident to unrestricted competition, and the inconvenience and dangers incident to the extensive multiplication of electric lines in the public streets.

Fitchburg Gas & El. Light Co.....Mass. G. & E. R., 1910. 50.

33—Capitalization.

Some criticism was directed against the policy which has led to the acquisition of numerous suburban companies in recent years, and the amount of investment made for that purpose. The purchases of these plants has necessarily involved a considerable abandonment of property and waste of invested capital, and the making good of this waste has borne heavily upon the earnings of the company reserved for depreciation. From the point of view of the public interest the justification of the company's policy must rest upon the introduction thereby of a more efficient and more economical electrical supply in the City of Boston, as well as in the rest of the territory served. Experience alone, and a larger experience than is yet available, will furnish a satisfactory demonstration of its justification. While the Board has no purpose to defend the prices paid for some of the companies, yet the Board still believes that with the waste eliminated and not permitted to remain a perpetual capital charge, and with a prudent and efficient management of the company's affairs, this extension of the company's business may prove to have been in the public interest.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 34.

399—Comparative Financial Statistics.

Many computations, comparisons and other evidence were introduced, by both parties, relative to the cost of the company's plant. The value of the comparisons made is greatly impaired by the lack of a satisfactory unit as a basis therefor. It developed at the hearings that figures showing kilowatt capacity of generating plants were not reliable, because of wide differences in practice in the rating of turbines. Neither do comparisons based upon the cost per kilowatt hour manufactured, appear entirely trustworthy, because the load factor may be far better in one plant than in another. For similar reasons, a comparison per kilowatt hour sold, is of qualified value. In fact, any calculations based upon such data are likely to be misleading unless the comparisons are accompanied by a full explanation of all facts and conditions surrounding the companies compared.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 35.

452—Diversity Factor.

The importance and significance of the "diversity factors" to the company's demonstration must not be underestimated. The purpose of their introduction is to so correct the relation of an individual customer's maximum demand to the maximum demands of all customers that his responsibility for the station "peak," and therefore of the company's investment because of it, shall be properly ascertained and apportioned. But accuracy in this process certainly requires that before the "diversity factors" are used the "fixed costs" shall be divided as between lighting and power, or any portions of the company's business to which they are applicable. The company recognizes the necessity of such a division, but, because of the obvious impracticability of making it, does not undertake it. Without it there is no demonstration that the resulting charge to the individual is proportional to his cost.

But the "diversity factors," however determined and applied, ascertain and apportion not the actual cost of supplying an individual customer, taking into account the conditions peculiar to his supply, but rather the supposed cost of supplying him, assuming that his supply is based on certain average conditions. It is equally evident that the investment for which each customer is claimed to be responsible is not an amount definitely ascertainable once for all, but an amount dependent upon a standard, namely, his maximum demand, which may vary widely from time to time without any actual influence on the company's investment.

Edison El. I. Co. of Boston.....Mass G. & E. R., 1909. 38.

5—Rate Theory.

The Board has stated and discussed the company's system of rates at considerable length because it represents, to a very large extent, the theory and practice prevailing among the electric light companies in this and other States. Since the adoption of it, and other systems more or less similar, the companies have developed the volume of their business and increased their revenue, and have become sufficiently strong financially to be efficient public servants. The Board also recognizes that it is not in the public interest that any changes in existing conditions shall be made so radical or rapid as to impair the efficiency of the company's service.

A kilowatt hour is now the established unit for measuring electricity. It represents a definite amount of electrical energy. It will do exactly the same amount of work for one customer as for another. Unless a customer can consider seriously generating his own electricity, the value to him of each kilowatt hour furnished by the company has no necessary relation either to demand, quantity or length of use. If, however, he can seriously consider supplying himself, these factors may affect his own cost, and therefore the price which he might be willing to pay the company instead of installing his own plant.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 42-43.

51—Cost of Servce.

The customers of every company have a right to a price based upon a reasonable operating cost, with a proper allowance for depreciation and a fair return upon a reasonable investment, entirely independent of the vicissitudes incident to the supply of other communities whose companies may be included in the same ownership.

Leominster Gas Light Co.....Mass. G. & E. R., 1910. 16.

51—Cost or Service Theory.

The justification of a system of individual rates plainly must rest, however, upon the practicability of ascertaining with reasonable accuracy the cost of supplying each individual customer, and of automatically apportioning this cost to him by the schedule of prices adopted. It is therefore essential that the company should be able to demonstrate that it is possible to ascertain individual costs with reasonable accuracy, since under its system a customer should not pay less than the cost of his supply, and properly, and probably legally, cannot be required to pay more.

The practical difficulty of ascertaining the particular cost of an individual customer, is also illustrated in the company's division of its annual expenses as between "fixed" and "running" costs. As already stated, "fixed costs" are apportioned according to the maximum station demand, and may be assumed to be dependent upon it. This perhaps is sufficiently accurate with regard to expenses connected with the generating department. But the problem is quite different with regard to the distribution investment and the expenses connected therewith. The distribution investment is practically one-half of the total investment. It is apparent that the actual costs of reaching and supplying individual customers must vary widely. It is clear that to separate the actual cost of reaching an individual customer is well-nigh impossible.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 37, 39.

55—Value of Service.

In distinction from the large body of customers just mentioned there is a considerable number, both actual and possible, who may readily supply themselves with light or obtain power from some other source. To such customers the value of the service furnished by the company will depend to a considerable extent on the probable cost of supplying themselves. If the company is to supply them, it is subject to the ordinary rules of business competition—it must meet prices established by conditions which it does not create and cannot control, or not do the business. The prices which an electric light company must thus meet or not do business are determined, not by an open market, but largely by individual conditions, which differ widely with different customers. Had the company not taken the initiative in offering prices which have attracted this business, and the customers now under consideration were attempting to compel the company to serve them at prices which fitted their respective conditions, it is probable that they could not compel the company to serve them except at a price open to all. On the other hand, should the company now refuse to serve its customers save at a uniform price, or uniform prices for lighting and power, respectively, as some have suggested, it is equally probable that the immediate effect would be a considerable loss in the volume of its business. The question arises whether or not the existing practice of the company in respect to its prices for business of this character is so far inconsistent with its recognized duty to serve all without discrimination that it should no longer be tolerated.

In considering this question it must not be forgotten that the advantage enjoyed by a customer whose use of electricity will warrant the installation of his own supply of electricity or power, is one which the company cannot prevent. It is equally to be remembered that there is always a strong temptation to the manager of a public service, if unrestrained, to maintain a high rate for business which he controls, while making disproportionate concessions to get that which can take care of itself. Experience is also making more and more evident that the duty of one who undertakes a public service must necessarily deprive him of the right to base his policies upon many practices common to, and even commendable in private business.

Edison El. I. Co. of Boston.....Mass G. & E. R., 1909. 45, 46.

612—Meter Rate.

If all the customers of the company were dependent upon it for a supply, it is believed that there would be little occasion to discuss or attempt to justify differential rates, and that a uniform meter rate, determined by reasonable operating costs and a fair return on the investment reasonably necessary for the public convenience, would prevail universally. It may be conceded that, if a uniform meter rate prevailed, there would be some unprofitable customers. This may be predicated with truth of any system of rates for a public service. The Board is of the opinion, however, that this view of such a rate is exaggerated, and that in any event it is likely to result in no greater amount of injustice than in an attempt to make every customer theoretically if not actually, profitable.

Those customers who cannot manufacture electricity for themselves, and whose needs and convenience the company is bound to serve, are chiefly of this non-contract class. Whatever view may be taken of the matter, the conditions under which customers so situated use electricity, are not so unlike as to make a uniform meter rate work any substantial injustice to them. Neither is there any sufficient advantage to the company, in the present system of rates as applicable to this class, to compensate for the complications and misunderstandings which they introduce. The Board is of the opinion that, in view of these considerations and in place of the present so-called non-contract lighting rates, the company should offer to sell electricity to its customers for any use at a uniform meter rate.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 44-45.

613—Demand Rates.

There can be no more desirable requisite for every public service charge, than that it shall be simple, definite and readily understood and applied. Even its most ardent advocates do not claim that these characteristics are inherent in the demand system. . . .

Of course, with respect to the so-called "competitive" customers, it is clear that prices should not be determined by special bargain in each case, and on whatever basis offered by the company should be free to all desiring a supply under like conditions. The demand system, whatever its faults in determining the individual's cost to the company, has at least the merit of recognizing the most essential elements determining the probable cost to the individual of supplying himself, and therefore operates to fit the price which the company must make to get his business, to his actual condition. To the extent to which this business is really competitive it will take care of itself. For these reasons the Board makes no recommendations with respect to these schedules, although believing that some readjustment with a view to their simplification upon broader and more uniform lines may be wisely undertaken.

The Board is aware of the danger of abuse in permitting concessions to some customers not granted to all. It is also aware that the terms "non-competitive" and "competitive" cannot be applied to the company's customers with precision, and that, if used, they may not describe with absolute strictness the present non-contract lighting as distinguished from the yearly lighting, power and elevator customers. But the Board believes that these terms recognize as existing certain economic conditions attending the sale of electricity which, in the interest of the many whose needs and convenience the company should serve, seem to warrant a continuance of certain differences in prices, not as a permanent policy, but until the uniform rate recommended can from time to time be safely reduced so low as to be in itself an encouragement to the unrestricted use of electricity for all purposes.

Edison El. I. Co. of Boston.....Mass G. & E. R., 1909. 44, 47.

619—Rate Differentials—Minimum Charge.

It is conceded on all sides that a public service corporation is entitled to secure from its customers as a whole a sufficient revenue by which it may live and prosper; and where, as in this case, it has a business well established, the imposition of such a charge is probably of more consequence to the general body of its customers than to the company itself. In other words, the interests of the company and those actual users of electricity who are dependent on the company for their supply, are so far identical that it is desirable from the standpoint of both, perhaps more emphatically from that of such consumers, that the company's business shall expand and develop along profitable rather than unprofitable lines, so far at least as may be consistent with a proper regard to the company's duty as a public servant. Electricity is fast becoming one of the common conveniences and even necessities of life, and the Board believes that it should be made available to a much larger portion of the community than it now is. But, in view of the constant advancement in the art, and of the large investment incident to placing wires underground in many cities, a too rapid expansion of the company's business in directions where, under present conditions, there is no substantial demand, may perhaps hinder, rather than help, that promotion of its use which the Board believes is on the whole so desirable. It is largely because of these considerations that the Board reached the conclusion that for the present it ought not to require the discontinuance of some minimum charge.

If such a charge is to be permitted, its amount is a matter of expediency respecting which the Board is not inclined to interfere, unless the manner of its imposition tends to work a real hardship upon small customers, and so become a palpable evasion of the company's public duty. Respecting the present charge, the Board is convinced that no increase in amount should be allowed, and that a smaller amount might be desirable.

If the company shall continue to impose a minimum monthly charge upon its customers who pay the prevailing maximum net price, such charge shall not exceed $1 per month per meter; and if on any thirtieth day of June it shall appear that a customer has, by reason of said charge, paid or become liable to pay during the year immediately preceding an amount exceeding the minimum monthly charge multiplied by the number of months in which he has been a customer, and an average price for electricity supplied by meter exceeding the prevailing maximum net price per kilowatt hour, the company shall refund all such excess; provided, however, that nothing in this recommendation shall be construed to require the company to render its service at an average charge per month less than the minimum monthly charge, or at an average price per kilowatt hour less than the prevailing maximum net rate.

Edison El. Ill. Co. of Boston.....Mass. G. & E. R., 1910. 40, 41, 42.

619—Rate Differentials.

The Board is unable to adopt the suggestion that the school committee as a large consumer is entitled to a discrimination. The Board has had occasion repeatedly to say to companies that discriminations in price, based solely on the amount consumed by different customers, are not justifiable. It is an open question whether the school committee is, according to the common acceptance of the term, a "large consumer" of electricity. It is true that the aggregate consumed in all of the buildings under the committee's care is large; but the amount consumed per building is small, and, as a rule, the buildings are widely scattered, and are, and must necessarily be, independently supplied. It would hardly be claimed that a private owner of similarly located buildings is entitled to different treatment solely because the aggregate of all of his bills is large.

Boston School Committee.....Mass. G. & E. R., 1910. 31-32.

619—Rate Differentials.

That it may be necessary to make differentials under exceptional circumstances may be conceded, but, if made, they must be upon the initiative of the company, rather than the Board. How far such differentials may be tolerated must depend primarily upon circumstances, and upon a clear demonstration of their immediate or future benefit to the general body of consumers. At least, it may be said that such differentials are not to be justified merely by the size of the customer's bill; that they should not be allowed except where the business is not otherwise obtainable; that they should be uniform to all persons for a like service; that the price should never be unnecessarily low, and should always be high enough to avoid a loss to the company.

Leominster El. Light & Power Co.....Mass. G. & E. R., 1910. 20.

619—Rate Differentials.

The chief question arose as to what extent, if at all, a differential system of rates such as the company has adopted is unlawful because discriminating. The company contended that differential rates, founded on differences in cost and condition of supply, are lawful. With the change to saying that such rates are not necessarily unlawful, this contention may for present purposes be conceded as a fair statement of the legal rights involved. It perhaps may also be conceded that competition, applying to one class or portion of the company's business, may produce such difference in conditions of supply as to make not unlawful a difference in rate. So, too, rates established by the company for certain classes of customers, or as they apply to certain classes, may not be unlawful even though returning less than their full proportion of profit.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 33.

62—Character of Service.

In the present development of the business, unless in the case of companies operating in very large communities, it seems unlikely that electricity can be sold for use for light at a price which will be attractive to those who desire to use it only for power. The price for that purpose, excepting where it may be for intermittent, isolated or very small powers, seems to be generally determined by its value to the user as compared with other available forms of power. While the practically exclusive privileges to construct its lines in the public streets are given a company primarily for the purpose of enabling it to supply electricity for light, yet the development of the art and the adaptation of electrical energy to manufacturing needs, have so extended its functions that it can no longer be regarded as a public agency for the supply of light alone. And, this being the case, it is very doubtful whether the Board should concern itself with the determination of any other than the fair price at which the company is bound to supply electricity to any one who may apply, for whatever use.

Leominster El. Light & Power Co.....Mass G. & E. R., 1910. 20.

62—Character of Service.

It is obvious that electric power cannot be sold to power users at a price much, if any, in excess of what it would cost them to produce their own power. Electric light companies, intended primarily for the supply of light, have generally been able, without substantially increasing their investment, to increase their output, and make their business more profitable by the supply of electric power. To do this, however, companies have been compelled to make prices for this service low enough to be attractive to power users, yielding usually considerably less per unit than the average price required to make its business profitable. To what extent it may be advisable for such companies to make the necessary investment expressly for the supply of large users of power, is a question not yet solved by experience, and dependent probably for a correct answer very largely upon local conditions.

Fitchburg Gas and El. Light Co.....Mass. G. & E. R., 1910. 50-51.

623—Large Light and Power.

So far no attempt has been made to define what is meant by the terms "large" and "small" users of power. It is doubtful if any fixed rule can be laid down or exact lines drawn for this division. Much will depend upon local conditions, and the changes in the business of the company and the community which may develop from time to time. There may be a shifting line of division between the two. The proper limits and conditions under which power should, in the public interest, be supplied by this company may be determined only by experience. The definition suggested by the legislative action in the French King Rapids charter must have consideration, and, for purposes of this case, may for the present at least be accepted as controlling. Under that act, those are rated as "large" users of power whose motors and apparatus connected for use are of an aggregate rated capacity of not less than 300 electrical horse-power, and whose annual consumption shall not be less than 450,000 horse-power hours.

Fitchburg Gas & El. Light Co., ...Mass. G. & E. R., 1910, 52, 53.

621—Small Lighting.

The Board is also convinced that the present system of rates has operated to select as customers those whom the company deemed desirable, and has tended to discourage small users of electricity from becoming customers. To the extent to which this is true the company is disregarding its plain duty. Furthermore, in the opinion of the Board the value of the small user to the company may have been underestimated.

Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 48.

625—Feature Rates.

In reaching out for additional business by making concessions from the average rate, it is plain that the only justification for permitting the continuance of such a policy is that this additional business will be for the benefit of the large body of customers who must pay the regular rate. For it is not the advantage of the few, but rather the advantage of the many which should be the controlling test. In the opinion of the Board this "competitive" business, if it may be so termed, is of such value in the present development of the company that it may be of substantial advantage to the customer who must pay the regular rate. In fact, the only means by which the average lighting customer can hope to see the price to him materially reduced is through a greater increase in the volume of the business relative to the company's investment. Long use of a customer's installation, especially during parts of the day or year when otherwise a considerable proportion of the company's plant is standing idle, even at very low rates, provided they reasonably exceed proper "running costs," may yield a revenue otherwise not available, which will materially help to dilute the company's general expenses, and should lead, as the business of the company develops, to the steady reduction of the price to the regular customer.

Edison El. I. Co. of Boston.....Mass G. & E. R., 1909. 46.

21—ORGANIZATION OF COMMISSIONS.

Organization of Railroad and Public Utilities Commissions, a 46 page pamphlet, issued by the Department on Regulation of the National Civic Federation, is the second to appear of the fifteen parts of its compilation and analysis of public utility regulation laws of the United States.

Those already issued are:

1. Regulation of Accounts
2. Organization of Commissions

To be issued:

Rate Reasonableness
Establishing and Change of Rates
Rate Publicity
Discrimination
Service
Reports of Utilities
Capitalization
Franchises
Safety of Operation
Jurisdiction and Definition
General Powers of Commission
Commission Procedure
Enforcement

The director of the investigation, Mr. John H. Gray, says: "In this part of our compilation we have gathered together all of the material found in the statute books relating to the organization and constitution of central commissions. This legislation is voluminous and its condensation and analysis has entailed a large amount of time and painstaking effort. It has been distributed to friends of the department and other interested persons, subject to final revision at a later date. We expect the compilation and analysis of public utility regulation laws to be extremely valuable to all who may be interested in the regulation by state authority of public utilities in any part of the country. It will be especially valuable to members of the legislatures."

New York public service commissioners are the best paid in the country; they receive $15,000 per year each. South Dakota commissioners receive least of all, their salaries being $1,500 a year. Members of the other forty-five state commissions and one Federal Commission receive between $1,900 and $10,000 per year. These commissions have in the aggregate no less than 156 members.

The membership of all the commissions with the exception of five, is three. The interstate commerce commission has seven members, and the California, Georgia, and two New York commissions have five members each. In the case of twenty-six of the commissions the members are appointed. Of the remaining twenty-three they are elected. The terms of office range from two to seven years. The members of twenty-eight of the commissions hold office for six years; of three for five years; of six for four years; of seven for three years; and of three for two years. The members of the interstate commerce commission hold office for seven years.

Stringent rules govern the relations of members and employes of commissions with public utilities. In many cases the holding of an interest in any such utility is a disqualification for membership. A commissioner usually is debarred from accepting any gift, gratuity, emolument or employment from any railroad or other public utility, except in some cases passes for use when engaged on official business. In many jurisdictions, members, or employes, or both, are authorized to pass free on railroads while in performance of their duties.

In twenty-eight jurisdictions, no member, officer or employe of the commission is allowed to engage in any other business, employment or vocation or hold any other political office. The statutes sometimes provide that members shall devote all of their time to the duties of their office and in other cases that they shall devote as much time as may be necessary. Several of the states provide for the assessment of the costs of conducting the commissions, to the utilities which are under the jurisdiction of the commissions. This is usually done on a gross earnings basis.

CURRENT REFERENCES

132—Protection from Competition (?)

Cheap Electricity for All, a 15 page pamphlet issued by the Conservation Commission of the State of New York.

In the form of questions and answers this pamphlet promises that, if all the waste water-power of the state (including 250,000 horse power from Niagara) is utilized by municipalities, the monthly price of lighting the private house will be one half the present average price, and electricity will be so cheap that it can be used economically in competition with gas or coal.

223—Rate Regulation.

The Milwaukee Fare Case. Decision of Circuit Court of Wisconsin. Electric Review, Oct. 19, 1912, p. 756.

Judge Stevens in the Circuit Court last week sustained the Wisconsin Railroad Commission's order to the Milwaukee Electric Railway and Light Company to sell thirteen car tickets for 50 cents. The company claimed the Commission had no authority for this action, as an ordinance passed by the Milwaukee Common Council in 1910 conferred upon the company the right to collect a five-cent cash fare during the life of the franchise. The opinion states "that the provision under consideration is a limitation upon the rate of fare that may be charged, and not a contract giving the plaintiff the right to charge a five-cent cash fare. It follows that the order of the Railroad Commission does not impair the obligation of any contract, and that the complaint does not state a cause of action." It is expected that the Milwaukee Railway Company will carry the case to the Supreme Court.

3—Economic and Financial

Municipal Electricity Loans. A paper by J. Horace Bowden and Fred Tait. The Electrician (London), 2½ pp. Sept. 20, 1912, p. 990, and, concluded, 2½ pp. Sept. 27, 1912, p. 1030.

The authors contend that the action of the London County Council in further reducing the periods of loans in respect of buildings, mains and machinery is ill-advised. The effect of such short periods is to throw a heavy burden on the undertaking when such loans are current, followed by a sudden relief (and consequent abnormal profits) upon their extinction. During such periods of relief there would be a tendency either to reduce the price per unit unduly or for the profits to be used for the relief of the rates. The authors advocate that depreciation should be allowed for at the rate of 10 per cent. per annum in respect of machinery and storage batteries, and 5 per cent. in respect of buildings on the written-down values, this allowance being independent to the sinking fund. In the second part of their article the authors refer to depreciation of mains, the necessity for working capital, contributions to taxes, the provision of renewal funds, and the adoption of a mean figure for the price of coal.

314—Overhead Charges.

The Milwaukee Fare Case, abstract of a paper by R. B. Stearns, read before the American Electric Railway Association, Chicago, Oct. 7-11. Electric Railway Journal, 4 pages, Oct. 11, 1912, p. 816.

A review of this case by the Vice-president of the company, with a summary of important conclusions and indications to be drawn from it, and including also a brief description of the street railway system of Milwaukee, and mention of the excellent work of the Wisconsin Railroad Commission in its valuation of the street railway property. Mr. Stearns points out this significant item: "The allowance of 12 per cent. for overhead charges of the nature just defined, calls attention to the necessity of economy in such expenditures, and the probable future difficulty of securing recognition in valuations, of relatively larger amounts expended for engineering fees and general contractor's commissions."

34—Rate of Return.

Automatic Rate Regulation, abstract of an address delivered before the Convention of the American Electric Railway Association, Chicago, Oct. 7-11, by Oscar T. Crosby. Electric Railway Journal, 5 pages, Oct. 11, 1912, p. 823.

Mr. Crosby urges definiteness in drafting new franchises, above all in the matter of specifying the rate of return to be allowed on the investment, which is coming to be in our country the decisive consideration in the regulation of rates.

359—Sliding Scale.

Public Service Commissions, a paper by Mr. Alten S. Miller, of New York, read at the annual meeting of the American Gas Institute, Atlantic City, Oct. 16, 1912.

Advocates the policy of definitely determining a basic valuation for every enterprise and allowing a sufficient return on this capital to compensate for all risks, thus insuring greater stability for such investments, a more liberal flow of money into developing public service business, which will be greatly to the advantage of the public in improved and enlarged service.

Mr. Miller says that ten years from the time such a plan is adopted the public will be getting much better service, or lower rates, or both, than under present conditions.

In practice nothing else has been found to work as well as the London sliding scale of rates. This plan makes the dividends which the company is allowed to declare, depend upon the price of gas, according as the latter is reduced, the dividends may be increased. Thus the company is rewarded for economy and skillful management, the public and the company both sharing in the profits.

5—Rate Theory.

RAILWAY TRANSPORTATION, by CHARLES LEE RAPER, reviewed by CHARLES HANSEL in Engineering News, Oct. 17. 1912, p. 740.

While it appears that the work deals with railroad rates alone, yet electric rate regulations so often follow the precedents of railroad rate decisions, that this information would be useful in any comprehensive study of rate theory and practice.

51—Cost of Service Theory

A paper presented to the HONORABLE MAYOR, PUBLIC UTILITIES COMMISSION, CITY COUNCIL, AND PUBLIC OF THE CITY OF SPRINGFIELD, MISSOURI, by the SPRINGFIELD GAS AND ELECTRIC COMPANY.

The paper is an analysis in as popular and non-technical a form as is possible to the subject, of the cost of supplying electricity, and the elements which make necessary differential rates, both in the interest of fairness of charges, and of the prosperity of the business, through which alone rates may be lowered.

The article mentions Mr. S. E. Doane's analysis of forty Electric Companies in the Middle and Western States by which it was found that the average Running and Standby percentages of total costs is 30% and 70% respectively.

91—Promotion of the Business.

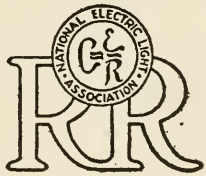
COMMERCIAL ENGINEERING FOR CENTRAL STATIONS, by ARTHUR WILLIAMS AND EDMUND F. TWEEDY, reviewed in Engineering News, Oct. 17, 1912, p. 743.

A compilation of papers dealing with subjects of particular interest to those engaged in central station commercial engineering work. The review says the authors have shown in this volume a few typical examples of the engineering scrutiny which should be given to each proposition to make an excursion into new fields of the central station business. The authors' statements are conservative and the book discloses fields where few prospects are seen, as well as the reverse.

This book was reviewed in the Rate Research Bulletin, No. 27, on July 17th, 1912.

Vol. 2 October 30, 1912 No. 5

RATE RESEARCH



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COMMISSION DECISIONS.

2—**Public Service Regulation.**

THE 26TH AND 27TH ANNUAL REPORTS OF THE GAS AND ELECTRIC LIGHT COMMISSIONERS, MASS., FOR THE CALENDAR YEARS 1910 AND 1911, contain the following rulings having a bearing upon electric rates.

122—**Just and Reasonable Charges.**

A public-service corporation exercising a virtual monopoly is bound to give its customers the best possible service at the lowest reasonable price; nor is the discharge of this duty to be measured merely by a comparison with the service and price prevailing elsewhere. After a payment of reasonable operating expenses, proper allowance for depreciation and emergencies, and a fair return upon the investment, surplus earnings should be used to facilitate further reductions in price. The Board is convinced that this company no longer needs to continue, as heretofore, to provide capital for extensions out of income.

Beverly Gas & El. Co.....Mass. G. & E. R., 1911, 18.

132—**Protection from Competition.**

The legislative policy with respect to the admission of a new company or person to supply electricity in a territory already served by an existing company, and the Board's interpretation and administration of this policy, are well known, and were not criticized or doubted by the petitioner in this case. * * * An electric light company has no necessary or legal monopoly of the territory which it serves. If it is not properly or adequately performing its public duties, a situation arises which may not only justify, but require this Board to admit a competitor. But with this restriction the prevailing opinion, based upon experience, has been that the community as a whole will be more adequately and economically served by one company than, in the language of the Supreme Court, by "as many companies or persons as may be minded to put wires in the streets and try their luck."

Worcester El. Light Co.....Mass. G. & E. R., 1912, 37.

So long as such an agency for the distribution of electricity in any given territory is adequately and properly performing its public duty, the public interest is better served by public supervision and regulation than by competition.

Clinton Gas Light Co.....Mass. G. & E. R., 1912, 48.

32—**Depreciation.**

This company has experienced, in an unusual degree, the vicissitudes incident to the progress of the art since it began the supply of electricity. Prior to the filing of this complaint the company had paid to its shareholders since organization only two dividends, amounting in all to 3 per cent. While it has apparently endeavored to maintain its prices in correspondence with other companies of similar size, it has never been able to recover out of income, an amount sufficient to meet the depreciation, and necessary cost of reconstruction of its plant. Its generating plant has, however, been recently very largely reconstructed, with efficient apparatus of the present-day type. For these reasons, and in this way, the company has acquired a substantial burden of debt which, so far as it represents depreciation cost, must be extinguished, if at all, out of income, and not out of new capital. Such financial condition, while it imposes upon the company a conservative course as to dividends, and in no respect lessens the regard it should have for the interests of the public in fixing its rates, may also fairly justify it in an endeavor to eliminate, in a reasonable time, that part of its indebtedness which represents the depreciation of the plant, for which provision has not been made hitherto. When this is accomplished further reductions in both public and private lighting prices may be confidently expected.

Plymouth El. Light Co.....Mass. G. & E. R., 1912, 30.

35—**Revenue, Expense, Income.**

Of the gross expenditures of the company, under its present management, for new construction, more than one-third, or upwards of $180,000, was obtained from earnings, and a large part of this in the more recent years. These figures indicate that, notwithstanding the numerous and fairly frequent reductions in price made by the company, the profits, in excess of dividends, which have been used to extend and improve its plant, have been larger than can readily be justified, in view of the duty which the company owes to the public. In the early days of public-service corporations such a policy was very general and was justified by the belief that, as the capital charge was kept low and the amount per unit required for dividends decreased, low prices might be more certainly and quickly attained. If, however, the claim now made

by some companies is to be conceded, and the same return is to be allowed upon the value of all property employed for the public convenience, from whatever source derived, no benefit accrues to the public from such an accumulation. If the claim can be successfully made, it amounts in effect, if not in form, to a stock dividend. But such a claim is not necessary to assure a continuance of the commercial prosperity of companies of this class.

Beverly Gas & El. Co.....Mass. G. & E. R., 1911, 17.

The company ought not to pay twice for carrying on its affairs. If they are conducted by the Light, Heat and Power Corporation, which is paid therefor, the officers of the North Adams Company can have only nominal duties, and should have only nominal compensation. It is the duty of this Board in fixing a price, to determine whether the operating costs are reasonable and fair. Whether the cost of management be paid to a corporation, an association, or a single person, may not be of importance to the public, but the public is concerned with the character of the management, and the reasonableness of its cost. The company is entitled to a reasonable profit above only reasonable costs. Reasonable profits presuppose or are based only on reasonable costs.

North Adams Gas Light Co....Mass G. & E. R., 1912, 21.

452—Diversity Factor.

In fact, inasmuch as experience has developed that low prices for electricity for light, are dependent upon the extent and diversity of the use of electricity for other purposes, it seems fair to conclude that any attempt to compel these two companies to observe competitive relations may not result in any advantage to small users of power, and if it does, then only at a corresponding disadvantage to the community as a whole.

Clinton Gas Light Co.....Mass G. & E. R., 1912, 49.

619—Rate Differentials.

It is perhaps only necessary to repeat here that in a case such as this the primary duty of the Board is to determine, not the propriety or character of differentials in price, but rather the fair price at which the company is bound to supply electricity to all who apply for it, for whatever use. If differentials are to exist at all, they should be upon the initiative of the company, rather than of the Board.

Stoughton Gas & El. Co...Mass G. & E. R., 1911, 24.

This company has a very considerable investment, made primarily for the purpose of supplying the community with light. If employed for this purpose alone, the daily use of the investment would be brief, and the cost per unit of electricity sold correspond-

ingly high; but the sale of electricity for power almost invariably increases the volume of the output without necessarily increasing the investment, thereby reducing the average cost per unit sold, and so making possible a lower maximum price. Because of such considerations, and because such increased efficiency in the use of the investment should lead to reductions in the maximum net price, the Board has been reluctant to interfere with certain differentials in price, especially those applying to power. In this course it has sought rather to benefit the many who must pay the maximum price, than the few in whose interest differentials are apparently made. These propositions indicate that the maximum net price for electricity cannot be determined solely with reference to the average cost per unit of all the electricity which a company may supply.

Newburyport Gas & El. Co..Mass. G. & E. R., 1911, 29.

619 Rate Differentials—Minimum Charge.

With respect to the minimum monthly charges for gas and electric lighting, the money value of these charges is not important to the company. No such charge had been made by the former management. The company had been, and would probably continue to be prosperous without it. It is supported by the claim that the readiness of the company to supply, is a convenience to the customer, and a service which has value even though he may not actually use the light, and that such service is of some cost to the company, which ought not to be required to render any service at a loss. * * * It may, indeed, be impossible to determine it in any individual case. If any such charge is to be made its amount must, therefore, be determined somewhat arbitrarily with reference to other considerations rather than its cost. While it is doubtless true that any public-service company may sometimes be legally and reasonably required to render certain services without a demonstrable profit, or even at less than the apparent cost, to require a company to give any service continuously or repeatedly at an obvious loss would be manifestly unjust and inexpedient.

North Adams Gas Light Co...Mass. G. & E. R., 1912, 22.

62—Character of Service.

The Board was unable to agree with the contention that the current used in all of the lamps should be combined and treated as the energy supplied to a single consumer; in other words, that all the lamps should be taken together and considered as a single installation of a large consumer. It is quite true that the billing and collection costs are minimized under the conditions of street lighting supply, and become those of a single customer, but the numer-

ous and widely scattered installations, and the investment and maintenance charges incident thereto, which constitute by far the more important items of cost, give to each lamp, or group of lamps, many of the characteristics of an individual customer of small size, if the commercial scale of charging is to be applied.

Plymouth El. Light Co.....Mass. G. & E. R., 1912, 28.

At any rate, it seems clear that, in this instance, by the phrase "electricity exclusively for power," the Legislature did not intend to describe a use of electricity confined to the operation of motors, but rather its use for mechanical and manufacturing purposes generally. This construction of the phrase would include in its scope, applications of electrical energy more aptly designated by the word "heat" than "power." It may also be fairly claimed, that the phrase includes the supply of electricity in bulk to local distributers, substantially as it would be received by them from their own generators.

This broader significance of the term "power" is in keeping with recent developments in the industry. Substantially all of the so-called "power" companies throughout the country are organized for the purpose, and actually engaged in the business, of transmitting and selling electricity for the uses just described. In England, in the 1908 London Electric Supply Act, it is expressly provided that in the construction of that act " 'power purposes' shall include all purposes for which electrical energy may be applied other than for use either directly or indirectly for lighting." While the common practice of electric light companies has been to use the word "power" in the classification of its business, both with respect to service and price, as applying to the supply of motors merely, yet it is significant that they have created but two classes of customers, namely, for "light," or "power," and in the rapid and varied extension of the application of electrical energy it is evident that these terms are becoming inapt and inadequate. For instance, the largest electric light company operating in this state has found it necessary in its rate schedule to define "power" as "general motor service, cooking, heating, electroplating, charging storage batteries and similar service, but not including the running of dynamos for electric lighting purposes." In fact, in mechanical propositions the terms "power," "force" and "energy" are often used indiscriminately to express the same idea.

Clinton Gas Light Co.....Mass. G. & E. R., 1912, 46.

623—Large Power.

During the last fiscal year the company's output for power exceeded its output for lighting, its power load was nearly one-half of its yearly peak, and it received for this power scarcely more

per unit than the bare cost of producing the electricity itself, without any substantial provision for expenses of distribution, management, taxes or investment return. Companies sometimes make disproportionate concessions to those who can supply themselves in other ways; and the effort to build up a business and improve operating conditions may afford a justification for such course. But no added burden on this account should be imposed upon its other customers, especially those who must pay the maximum price.

Newburyport Gas & El. Co....Mass. G. & E. R., 1911, 30.

626.—**Street Lighting.**

While evidence of prices charged in other communities for street lights is not without weight, it can seldom if ever be regarded as controlling. Its force is also greatly weakened by the fact that such comparisons must usually be made with prices charged for carbon filament lamps, or originally made for such lamps, and continued even where, as is now so common, tungsten lamps have been substituted; and by the further fact that, until very recently, in fixing prices for street lights, no consistent, rational theory has been followed, either by the companies or by the public authorities, save a purpose on both sides to make the best trade possible. Whatever force may have formerly attached to the candle-power as an arbiter of rates, it must under present business methods, and the development of the art, be supplanted by a consideration of the energy supplied.

Plymouth El. Light Co.....Mass. G. & E. R., 1912, 26.

91—**Promotion of Business.**

It would be a distinct menace to the public interest, and a serious embarrassment to proper supervision and regulation, if corporations engaged in the performance of a public service should extend their activities to other lines of private trade or business. So long as the companies keep within what is plainly subordinate and incidental to the performance of their public service, no public interest seems to be injuriously affected or endangered, and for that matter the practice of selling and installing gas and electric appliances may often be clearly of public advantage.

Lowell Gas Light Co.....Mass. G. & E. R., 1912, 90.

MICHIGAN RAILROAD COMMISSION

132—**Protection from Competition.**

Application of the VERMONTVILLE FARMERS' INDEPENDENT TELEPHONE COMPANY for a certificate of public necessity and convenience to operate in the village of Vermontville, to parallel the lines of the Citizens' Telephone Company, to enter into active competition with that company, and to offer residence party line service at $12 per annum as against the rate of $15 charged by the Citizens' Company.
Decision of the MICHIGAN RAILROAD COMMISSION, August 29, 1912, denying the application.

31—**Valuation.**

The Commission made an appraisal, by the reproduction cost method, of the property of the Citizens' Telephone Company, whose rates were the matter of complaint, and investigated its earnings.

34—**Rate of Return.**

It was found that, at the present telephone rates, the rate of return on a reasonable valuation of its entire property was 6.78 per cent for the eleven and one-half years of its operation.

32—**Depreciation.**

The Commission stated that if depreciation had been allowed to accrue at 6 per cent as it should have been, the actual net earnings of the company would be reduced to less than 1 per cent per annum for the entire period.

112—**Franchises.**

The construction and operation of telephone properties is not a matter of common right. Like other corporations of a quasi-public character, a telephone company operates only by virtue of the privilege or franchise granted by the State, and the State through its Legislature, and under the constitution, imposes such restrictions and limitations as it sees fit.

12—**Protection of the Public.**

The general purpose of the statutes requiring a certificate of public necessity and convenience, is to prevent the needless duplication of public utilities, and the financial loss and unsatisfactory service which results from the struggle of two or more companies within a territory that can supply no more than sufficient business for one.

51—Cost of Service.

Although the applicant can construct a plant at a less cost than the reproduction value of the existing utility, the introduction of a new company would result in a division rather than an increase in revenue, would duplicate facilities, and limit the general telephone use, and would entail practically a double burden of expense upon those subscribers who found it to their interest to install both telephones.

COURT DECISIONS

131—Confiscatory Rates.

Wesmern Railroad of Alabama, and Central of Georgia Railroad Company, vs. Railroad Commission of Alabama, et al. Decision of District Court Alabama, May 29, 1912, giving judgment in favor of railroad companies, 197 Federel Reporter 954.
This is a complaint that the rates for passenger and freight transportation for intrastate business, as fixed by the new state rate statutes, are confiscatory.

34—Rate of Return.

Under the conditions attending the business of railroads in Alabama, a railroad company is entitled to earn a net profit of 8 per cent, on the value of the property devoted to the service, where its charges are just and reasonable in themselves, and a schedule of rates fixed by law on intrastate business which will not permit a company to earn such return from that business is confiscatory and unconstitutional.

The Master's valuation and investigation of revenue, showed that the earnings of the railroads at the old rates for the past six years in its intrastate business, averaged from 1.99 per cent to a deficit of $7,822.93, and on this finding, the court issued a decree of perpetual injunction against the statutes.

The legislation was the outgrowth of a popular agitation for the reduction of rates, and the decision concludes with a paragraph of vindication of the courts as against the political exigencies of legislatures.

139—**Limitations to Service.**

CHICAGO, BURLINGTON & QUINCY R. R. vs. OGLESBY, et al. Judgment in favor of railroad company.
Decision of District Court, W. D. Missouri, July 20, granting a temporary injunction, 198 Federal Reporter 153.

This was an action by the railroad company to enjoin an order of the Missouri Board of Railroad and Warehouse Commissioners, requiring the company to operate an additional daily passenger train on a branch line.

The injunction was not granted on the grounds of the additional loss of money to the company which it was shown would ensue from the enforcement of the order, but because the evidence showed that the order called for facilities greater than are customarily provided on like branch lines, and than the traffic there warranted.

It was held that "the mere fact that the income from the expenditure at a particular point upon a railroad may not be a fair return upon the capital invested at that point, is not conclusive in determining the reasonableness of an order of the Railway Commission requiring the improvement at such point"; though "the fact that the furnishing of a necessary facility ordered may occasion an incidental pecuniary loss, is an important criteria to be taken into view in determining the reasonableness of the order."

511-512—Apportionment of Investment and Expense.

One of the Member Companies, in revising its rate system on the Cost of Service theory, has enquired as to the proper distribution of several items of expenses, and the following opinions of two of the most important commissions, while entirely different, are relevant and of interest.

Massachusetts Gas and Electric Light Commissioners.

The division made by the company of its expenses into "fixed" and "running" costs was considered and criticized in great detail in its relation to the determination of individual costs. For the purposes of this inquiry it does not seem to be necessary to attempt to discuss most of the items of the actual division made, or to reach a conclusion as to whether or not a different division might be made, or a third division created with results more scientifically accurate. Two items of "fixed costs," however, are of sufficient size to merit attention, namely, general expenses of management, and dividends.

By putting dividends into "fixed costs" they seem no longer to represent profits, but rather interest on the capital employed in the business. But while, in determining the rate for the primary hours, the company made this assumption, yet later it claimed that it was from the secondary, rather than the primary, rate that a certain portion of the profits of the company should come.

A very considerable part of the company's investment has been for the purpose of reducing operating expenses, and to this extent, on its own theory, a certain proportion of the dividends belong with "running costs." On the other hand, if dividends be reckoned as in the nature of profits, then they cannot be known and divided until all the results of the business for the given period have been determined. The company's system, however, demands of each customer his theoretical pro rata contribution for this purpose as the sine qua non of doing business with the company.

It is also difficult to find on what theory general expenses of management are directly dependent on investment. Ordinarily it seems to be assumed that such expenses are incurred for the benefit of the business as a whole, thus warranting attributing them to output, and averaging them among the units sold.

The basis for the prices charged to non-contract lighting customers has already been described. Whatever may be said of the company's other prices, its method of determining the primary and secondary rates for this class of customers has little or no reference to the individual, but rather to certain average conditions of supply, and to the average return to be obtained from these customers as a class.

In what has been said the Board has not intended to discuss every phase of the company's system of rates or every possible objection to it. The Board is of the opinion that no differential system of rates for a public utility can be equitably and properly based solely upon the cost to the company of supplying the individual. It is important, however, where such a system exists, that in case of dispute over the price, or upon application for a compulsory supply, the actual cost to the company of serving one customer in distinction from all others should be capable of definite proof.
Ed. El. Ill. Co. of Boston.....Mass. G. & E. R., 1909, 40, 41, 42.

Wisconsin Railroad Commission.

The expenses for the entire plant are apportioned between the consumer, capacity and the output costs. * * *

Of the total expense, that under "consumers" amounts to about 16.14 per cent; that under "capacity" to 21.84 per cent; and that under "output" to about 62.02 per cent.

The direct expenses are, station, distribution and collection expenses. They consist of all items that are incurred for more specific purposes and which, therefore, can be directly charged to the account covering this purpose.

The overhead expenses are, * * * general, new business taxes, depreciation, interest and profits, bad debts, and extraordinary expenses. These expenses are common expenses incurred for various purposes in such a way that they cannot be exactly apportioned between them. Items of this character are, therefore, general in their nature. The best and fairest way would seem to be, to apportion them in proportion to the direct expenses. This is the method most frequently used in some form, in other industries where cost accounts are kept.

Under consumers direct expenses are included, items that are of such nature as to be peculiar to each consumer, or dependent on the consumer. Among such items are found the cost of placing, moving, maintaining and reading meters, all or a part of the gratuitious work that is performed, and part of the line and pole maintenance. These items are all found under distribution. The consumer expenses further include all of the direct costs of collection.

The expenses depending directly on the demand include a part of the station expenses, as well as a part of the expenses of distribution.

The expenses depending directly on the output cover the greater part of the station expenses, and a considerable proportion of the cost of distribution. * * *

It should be borne in mind, however, that the proportion of the total direct expense that should be assigned to the consumer, the demand, and the output, vary with the conditions under which the plant is operating. As the consumer expenses are of the same nature as demand expenses, they have mostly been treated as demand expenses in computing the costs per unit.

For the plant as a whole the direct expenses have thus been separated according to their nature between the consumer, demand, and output, while the indirect or overhead expenses have been allotted on about the same basis as the direct expenses.

Madison Gas and Electric Co. W. R. C. R., 1910, 664, 665.

CURRENT REFERENCES

122—Just and Reasonable Charges.

Reasonable Gas Rates and Their Determination, a paper by C. L. Cory, read before the Pacific Coast Gas Association, September 1912, 30 pages.

This paper points out that while rates are of great importance to consumers, service is of more vital consequence, and shows that there is a mutual responsibility between the manufacturer and the user. Rate of return, value, and cost of developing the business, are treated in separate sections and a practical illustration in the determination of gas rates for a city of 12,000 is given, with curves and tables.

2—Public Service Regulation.

Methods of Procedure Under the Wisconsin Utility Laws—Benefits and Restrictions of the Law. Abstract of a paper by C. B. Salmon, President of the Beloit (Wis.) Water, Gas, and Electric Company, read before the Central States Water Works Association 1912. Engineering and Contracting, 2 pp. Oct. 16, 1912, p. 425. Describes the Commission's methods of Valuation, Depreciation, Going Value, Standards of Service, Accounting, Rates, Interest and Profit.

This is interesting as the expression of the President of a company which has been operating under, and whose rates have been regulated by, the Wisconsin Commission. He argues for the Sliding Scale—since, if only a reasonable return is allowed, it will discourage improvement, and result in only a fairly reasonable service and no better rate.

2—Public Service Regulation.

The Cost of Regulation, an editorial, Electrical Railway Journal, Oct. 26, 1912, p. 904.

States that there has been a tendency in certain states to criticise the expense of commissions, and points out that the only fair test of such expense is in the results obtained, the justice of the commission decisions on formal questions, and the fairness with which it meets and protects at all times, the rights of the public and the corporations. But as far as figures alone can measure the value of a commission, a reasonable indication would be what percentage of the capitalization approved, or what percentage of the gross earnings of the companies regulated, was expended by the regulative body in the course of a year.

2—Public Service Regulation.

The Fifteenth Annual Meeting of The Kansas Gas, Water, Electric Light and Street Railway Association, Electrical Review, October 26, 1912, p. 799.

The association placed itself on record as in favor of regulation by the Public Utilities Commission of Kansas, provided that body be given the power necessary to make such regulation efficient, and that municipal plants be placed upon the same basis as privately owned utilities. It was the sense of the convention that the society should co-operate in bringing about the necessary legislation, during the coming session of the Legislature, to make the Public Utilities Commission of the state more effective, and to the end that the utilities in general, as well as the people, should be benefited by such regulation.

32—Depreciation.

Methods of Determining the Life of Public Utilities. An abstract of a paper by Halford Erickson of the Wisconsin Railroad Commission, read before the Central States Water Works Association, 1912. Engineering and Contracting, 2½ pp. Oct. 23, 1912, p. 448.

Describes Depreciation, Wear and Tear, General Decay, Inadequacy, Depreciation as an Operating Expense, Methods of Estimating Life of Property, and Composite Life of Plants.
This is a valuable paper and is a fine summary of how the Wisconsin Commission is handling Depreciation.

39—General Economic and Financial Information.

The Cost of Light and a Comparison of Lighting Units, a 3-page paper by A. G. Rakestraw, Southern Electrician, October, 1912, p. 436.

Four sets of curves are presented showing the total cost of producing light per 1000 spherical candle power hours, with varying cost of current per kilowatt hour, for different filament, arc, and vapor lamps; these are compared with each other and with gas.

749—Smoke Regulation.

Economic Phases of Smoke Abatement, Engineering News, 2½ pp. Oct. 24, 1912, p. 753.

A report of a meeting held in New York City, Oct. 8, under the auspices of the American Society of Mechanical Engineers, at which was presented very interesting information as to the great economic expenses due to the smoke nuisance, its effect on health and efficiency, and the measures and devices used for combating it.

621—**Small Lighting.**

Present Practice in Small Store Lighting With Tungsten Filament Lamps, a paper by Clarence L. Law and A. L. Powell, presented before the 1912 Convention of the Illuminating Engineering Society. Electric Review. 4½ pp. Oct. 26, 1912. p. 775.

Gives the result of an extended investigation of lighting conditions in over 800 small neighborhood stores in New York City. The following is a summary of values found.

Type of store—	No. Investigated.	Maxi.	Mini.	Watts per Sq. Ft. Avge.	Recommended.
Art stores	14	2.02	0.40	1.01	1.3
Bakeries	29	1.74	0.25	0.82	0.8
Barber	34	2.62	0.51	1.23	..
Cigar	29	2.00	0.39	1.45	1.4
Clothing	78	3.12	0.27	1.37	1.5
Confectionery	30	2.38	0.26	0.97	1.0
Delicatessen	29	3.36	0.37	1.11	1.1
Drug	24	1.85	0.43	1.01	1.2
Dry Goods	28	2.50	0.69	1.26	1.0
Florist	13	1.59	0.48	1.07	1.1
Grocery	53	2.73	0.30	0.98	1.0
Haberdashery	23	4.95	0.60	1.43	1.7
Jewelry	26	4.38	0.50	1.54	1.6
Meat Markets	32	2.42	0.40	0.91	0.9
Millinery	27	4.16	0.30	1.28	1.3
Music	11	1.85	0.60	1.05	1.1
Restaurant	27	3.20	0.42	1.08	1.1
Shoe	31	1.87	0.36	0.98	1.0
Stationery	35	2.40	0.45	1.02	1.0
Wines & Liquors	25	2.85	0.40	1.20	1.0

The weighted average of the above 600 stores is 1.138 watts per square foot. The information should be of value to companies considering the adoption of a rate differential based upon Floor Area.

8—Municipalities.

Ownership of Puplic Utilities, a paper by John B. Miller, President Southern California Edison Co., Los Angeles, Journal of Electricity, Power and Gas, 1 p. Oct. 5, 1912, p. 299.

The paper supports the privately owned utility, pointing out that under municipal ownership, extensions are not made with nearly the liberality or promptness that exist under private ownership. Utilities should be monopolies in order to give the people the best service and should be regulated by a State and not a local commission.

Vol. 2 November 6, 1912 No. 6

RATE RESEARCH

PUBLISHED BY THE
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OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

Vol. 2. Chicago, November 6, 1912 No. 6

69— NEW RATES—HARRISBURG, PA.

The Harrisburg Light & Power Company (Penn.), has issued a very attractive booklet—Electric Current for Residential Purposes, giving the new rates, effective October 1st, 1912.

SCHEDULE A.

Character of Service.

This rate will apply to electric service to all residences where the electric current is used for lighting, miscellaneous purposes, or for residential electric power, up to and including one-quarter horse-power motors as used on the premises.

Rate.

10½ cents per K. W. H. per active room for the 1st 4 K. W. H. per month.

5½ cents per K. W. H. for monthly excess use.

Classification of Rooms.

Active: Alcove, ballroom, billiard-room, bedrooms in excess of 3, conservatory, den, dining-room, drawing-room, dressing-room, garage, gymnasium, kitchen, library, living-room, music-room, observatory, parlor, plaza, reception-room, reception-hall, stable, studio, and all rooms occupied by servants even if located in adjacent buildings but connected to residence meter.

Inactive: Attic, bathroom, bedrooms (3) Cellar, closet, coal-shed, corridor, garret, hallway, hothouse, laundry, pantry, piazza, playhouse, portico, sewing-room, sun-parlor, sheds (storage), toilet-rooms, tower room, unfinished rooms and appliances.

Discount.

10% on bills paid on or before 12th day after presentation.

Minimum Charge.

$1.00 net per month.

Lamp Renewals.

Gem or Carbon Filament lamps will be renewed and delivered to customers' premises without charge.

EXCESS INDICATOR FLAT RATE.

Character of Service.

Residential Lighting with Mazda or Tungsten Lamps only.

Rate.

1¼ cents per Watt of Demand per month, paid in advance.

Discount.

20% for all bills paid on or before 12 days after date of rendering bill.

Lamp Renewals.

Customer to furnish his own lamp renewals.

Term of Contract.

One year.

Note:

The ordinance requires this rate shall be continued as an option for three years, provided excess indicators of the type now used by the Company, are manufactured and sold on the market during that time.

69— NEW RATES—ROCHESTER, N. Y.

The Rochester Railway and Light Company issued on November 1st a new rate for power.

THREE RATE SCHEDULE.

Consumer Charge.	Class 1.	Class 2.	Class 3.
Summer, Apr. to Sept. inclusive	$2.50	$18.75	$127.50
Winter, Oct. to Mar. inclusive	2.50	21.25	152.50
Demand Charge.			per. kw.
Summer, Apr. to Sept. inclusive	3.00	2.35	.90
Winter, Oct. to Mar. inclusive	3.60	2.85	1.10

Energy Charge.

1 cent per kilowatt hour.

Classes of Demand.

Dependent upon the Consumer's maximum demand during any winter month within the term of this contract, his rates shall be under Class I, Class II, or Class III, as hereinafter provided; and the Consumer agrees that should the maximum demand in any winter month exceed that fixed for the class under which his rates have previously computed, he will automatically pass to the class within which said higher maximum demand occurs, and remain in this class for one year thereafter, unless this contract is terminated in accordance with the provisions made therefor hereinafter.

Should his demand during any summer month exceed the demand fixed for his class as hereinbefore provided, such demand shall determine his class for that month only.

The classes are as follows:

Class I, Maximum demand from 7.5 kilowatts up to and inclusive of 25 kilowatts.

Class II, Maximum demand from 25 kilowatts up to and inclusive of 75 kilowatts.

Class III, Maximum demand above 75 kilowatts.

Discounts.

As a part of the rates herein provided, the Consumer agrees to pay in addition to the net bill computed hereunder, the sum of ten per cent (10%) of such bills, provided bills rendered on or before the sixth day of any month for service during the preceding month, are not paid on or before the fifteenth day of the month in which they are rendered.

Waiving Consumer Charge.

The Company agrees that if the Consumer delivers to the Company a two-days' notice in writing to disconnect the service for one period of not less than thirty (30) days in any calendar year, it will cancel the Consumer Charge during said period and thereafter until the service is reconnected.

Service Connections..

The Consumer agrees to pay the cost of service connection at the rate of 10 cents per foot for overhead service, measurements to be made from the nearest regular line pole; and at the rate of $1.50 per foot for underground service, measurements to be made from the street curb line, the charge to be not less than $5.00 in any case.

Off Peak Option.

Whereas the Company has, outside the hours from 4 p. m. to 7 p. m., during the winter months, extra generating, converting and dis-

tributing equipment available; therefore to encourage the utilization of its service outside the so-called peak hours above recited, the Company agrees to compute all demand outside the peak hours during the winter months in excess of the peak demands as 60 per cent of such excess, both for the determination of the Consumer's class, and for the determination of his bills. In consideration whereof and of extra expense to the Company, Consumer agrees to pay $1.00 per month in addition to the charges hereinbefore recited. The charge of one cent per kilowatt-hour for energy consumed shall be made as on the normal schedule of this contract.

Night Service Option.

Whereas the Company has, between the hours of 10 p. m. and 6 a. m., unutilized generating, converting and distributing equipment; therefore, to encourage the utilization of its service during the so-called night hours above recited, the Company agrees to compute all demand during the night hours in excess of that taken during the other hours of the day as one-half the exeess actually registered. In consideration whereof, and of extra expense to the Company, Consumer agrees to pay $1.00 per month in addition to the charges hereinbefore recited. The charge of one cent per kilowatt-hour for energy consumed shall be made as on the normal schedule of this contract. This option is accepted by the parties hereto and made a part of the contract for power on the Three-Rate Schedule attached.

Lamp Renewal Option.

At and for an extra charge of one-half cent per kilowatt hour, which the Consumer agrees to pay, the Company agrees to renew all burned out standard carbon or gem lamps of four candle power and larger, purchased from or renewed by the Company and used upon its circuits, when returned with the glass unbroken.

Term of Contract.

One year and until ten days' notice by either party.

NOTE.—As soon as the proper demand device is on the market the Rochester Company proposes to extend the above rate to a fourth class running from 0 to 5 kilowatts and to then make this rate the only basis for service. The Company believes that this new schedule, which accomplishes some voluntary rate reductions from the old sliding scale schedule, will be easier to explain to the non-technical customers, will insure proper return for the short-hour business and will, through the options, encourage off peak demand. The schedule also automatically takes care of emergency service.

69— NEW RATES—LONDON, ENG.

The Borough of St. Marylebone Electric Supply (London, Eng.) has made an interesting modification of its tariff for cooking, Telephone System. The original rate was as follows:

RESIDENCE RATES.

Primary Charge.

From $55.00 to $50.00 per kilowatt of connected load payable annually in advance.

Note:

The primary charge is based on the number, actual candle power, and watts of the lamps installed. Only active lamps are used, such occasional and convenience lamps as those in lavatories, bathrooms, cupboards, larders, conservatories, and other places where light is required intermittently, are not included. Typical charges being as follows:

No. of 25 watt lamps	Payable in Advance Annual charge £ s. d.	Quart'ly Chg. £ s. d.
20	5 12 0	1 11 0
34	9 16 0	2 14 0
102	26 10 0	7 5 9

Secondary Charge—Light.

1 penny per kilowatt hour consumed.

On June 30, 1912, an alternate rate was made offering a secondary rate of ½d. per kilowatt hour consumed, on condition that a one-third increase be made to the annual or quarterly charge.

Secondary Charge—Cooking and Heating.

1 penny from October to March inclusive.

1 penny less 25% from April to September inclusive.

On October 17th this special ½d. rate was made applicable, for cooking only, to business premises under contract for lighting, as well as to residences.

As the two classes of heating load, residence and business, are not, as in the case of cooking, of equal value owing to the fact that the business heating load overlaps the lighting load and is taken only for 5 to 5½ days per week as compared with seven days in case of residence; the ½d. heating rate for business premises is allowed only on payment of an additional 20 per cent on the primary charge under the Telephone System.

283— COMMISSION REPORTS—WISCONSIN

The Wisconsin Railroad Commission has just issued Vol. VI of its reports, giving opinions and decisions rendered from November 11, 1910, to June 14, 1911.

The following electric cases are included in this report. Page.

Bloomer Electric Light Plant....506
Application to increase rates. Granted.

Durand Light and Power Company....334
Application to increase rates. Granted.

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Milwaukee Electric Railway and Light Company....64
Complaint of electric power rates. Dismissed.

Red Cedar Valley Electric Company....717
Application to increase rates. Lighting rates denied, power rates granted.

Sheboygan Railway and Electric Company....353
Complaint of street lighting rates and service. Ordered: better service and reduced rates.

Whitewater Electric Light Company....132
Complaint of Street Lighting Service. Ordered: adequate service.

282— COMMISSION REPORTS—NO. CAROLINA

The Thirteenth Annual Report of the Corporation Commission of the State of North Carolina for the year ending December 31, 1912, 696 pp.

The jurisdiction of this Commission is threefold, (a) as a Public Service Commission, (b) as a Banking Commission, (c) as a State Tax Commission.

A summary of Acts Relating to the Commission is given in the beginning of the report. On page 3 the general powers, which do not include Electric or Gas Companies as under the control of the Commission, are defined, Chapter 20, Revision of 1905, Section 1066. The report contains Railroad and Tax Assessment statistics, and decisions rendered. These are local and throw no light on Electric rates.

81— MUNICIPAL REGULATION

Report of the Investigation of the Chicago Telephone Company, Submitted to the Committee on Gas Oil and Electric Light of the Chicago City Council, by Professor E. W. Bemis, Oct. 31, 1912, 127 pages.

In 1910 Messrs D. C. & Wm. B. Jackson, engineers, and Messrs. Arthur Young & Company, accountants, presented a report on the Chicago Telephone Company. On June 16, 1910, the Council Committee, not entirely satisfied with the previous report, directed William J. Hagenah, Chief Accountant of the Wisconsin Railroad Commission, to make an additional report. This report was submitted on May 2, 1911, and no action taken upon it. On July 17th, 1911, Professor Bemis was instructed to make an additional report.

This report was delayed until an appraisal made by B. J. Arnold and H. M. Byllesby & Co. was finished, and this appraisal was used as a basis for the Bemis report.

The report is to be specially noted for its elaboration of depreciation, and depreciation reserve funds, life of property and extraordinary depreciation. An interesting historical summary of telephone conduit practice might be of value in electrical cases. Prof. Bemis' criticisms of the Arnold-Byllesby valuation gives the impression that this is a remarkable piece of work as in the report he argues for only a reduction of $2,607,542 out of a total of $44,898,103. As usual, he has been influenced by the Wisconsin decisions in his consideration of overhead allowances. In the matter of appreciated real estate he has followed the Public Service Commission for the First District, New York, in allowing the increased value in the inventory, but has added the yearly appreciation to income.

City paving over conduit is not allowed, and working capital is slightly reduced. The Byllesby-Arnold theory of the Cost of Plant Development and the Cost of developing the business are not allowed. A considerable discussion is given to Rate of Return and an allowance of 6½% to 7% is considered sufficient. Municipal requirements in the shape of removal of underground construction on account of subway work, and extraordinary depreciation on account of new buildings and improvements in the art, are treated upon the basis that this anticipated burden will not materialize to any more serious degree than those which the Company has met in the past.

A City Telephone Bureau with the right to investigate complaints is recommended.

In conclusion, Professor Bemis states that a reduction of $700,000 in the charges of the Company appears reasonable, but he avoids the issue as to which charges should be reduced, leaving this to the Council Committee and the Company.

Some of the interesting paragraphs of the report are as follows:

32—**Depreciation.**

The final element in operating expenses centers around the effort to keep the original value of the property intact.

Before we can consider a fair return on the cash put into a property by the stockholders and bondholders, we must assume that the principal of the investment has not depreciated in value. Otherwise the investor will have the right to demand in his turn not only a fair profit, but insurance against loss of the original investment.

Now a telephone company, like other municipal utilities, has a tendency to the decline in value of its property from four causes, viz., physical decay, inadequacy, obsolescence, and municipal requirements. A word may be said with regard to each.

1. PHYSICAL DECAY OR WEAR AND TEAR. All material things wear out in time, or are liable to destruction by accident. Repairs must be constantly made, and in time the plant must be renewed or replaced.

2. INADEQUACY. The development of the business of a telephone plant often requires the substitution of larger switchboards, underground cables with more wires, etc.

3. OBSOLESCENCE. Invention frequently leads to the substitution of new plant for old. For example, we no longer are content with the ringing of a bell in order to secure the attention of "Central," but seek immediate attention by the mere removal of the receiver from the hook. New types of cable and duct are introduced from time to time.

4. MUNICIPAL REQUIREMENTS. Cities more and more require the burial of wires in expensive conduits, and sometimes require the re-location of the conduits themselves to make room for subways, etc.

All four forms of decline in value have been encountered here. Three lines of expense have been incurred to meet them—repairs, reconstruction, and depreciation reserves. The first two, repairs and reconstruction or renewals, are often classed together under the name of maintenance. They alone represent actual expenditures, directly designed to keep the plant intact. The Chicago Telephone Company, however, has accumulated a reserve to meet extraordinary requirements, and such depreciation from inadequacy and obsolescence as, in a rapidly growing plant might not be fully met from the maintenance account. (Pages 17-18.)

In a new plant which has not yet reached its "gait" of renewals, a depreciation reserve appears desirable. In the case of a company as old as the Chicago Telephone Company, the time may soon arrive when renewals will take sufficient care of depreciation, as in the case of our older gas companies and railroads.

A depreciation reserve has thus far been needed by the Chicago Telephone Company. (Page 49.)

31—**Valuation.**

At this point the appraisal made for by the Company by Byllesby & Arnold becomes of vital importance. Does this appraisal, made with great care and regardless of expense, show that enough has been collected from the subscriber to keep intact the investment by the stock and bond holders, of approximately $33,000,000? If not, then the investor is justified in calling on the telephone user for a larger yearly addition to the depreciation reserve. On the other hand if the payments by the subscriber to this fund have more than kept the property intact, a smaller contribution may henceforth be reasonably made by the public. (Page 29.)

315—**Intangibles—Cost of Plant Development.**

Byllesby-Arnold Statement. "The expenditures cover a variety of items, such as the alteration or reconstruction of buildings to provide for the enlargement of the plant, and reconstruction or enlargement of equipment incident to the growth of the business. For example, certain exchange offices, when built, were of ample capacity to handle the needs of the company at the time they were constructed. They, however, were built with provision for extension at a future time, and at a later date they were reconstructed and enlarged as necessary to handle the needs of the company. As a result the total expense of buildings to the telephone company including this reconstruction, is greater than the value of the property as determined by inventory of the building as it now stands.

"In a similar way, many changes in telephone equipment have been made due to the development of the business, which have entailed expenditures that would not be included in any value arrived at by the inventory. It is the intention to include in the plant development expense such an amount as would represent the normal expenditure that would be made in case the property is reproduced within the assumed construction period of from five to eight years." (Page 40.)

Bemis' Argument. It may be a logical consequence of the theory of reproduction to allow this plant development cost, but to one who holds that a voucher is better than an estimate, and that the cost of recent construction furnishes better unit figures for reconstruction than does the judgment of even the best engineers, it does not appear to be a correct view. Since the entire construction cost that has gone on the books of the Company is only five-sixths of the estimated reproduction cost as estimated by Byllesby & Arnold, a further addition of nearly $750,000 for estimated changes of plant during construction seems hardly warranted. The cost of such changes must have been put upon the books and must

have appeared in the book value of the property, or must have been charged to operating expenses and thus have been paid for by the telephone subscriber. In the former case, the Company secures the equivalent of the above cost. In the latter case, it does not appear entitled to this value, if secured from the consumers under the guise of operating expenses. If the latter, as put upon the books, had been less, the profits would have appeared to the community greater, and there might have been an even larger reduction of rates in the November, 1907, ordinance than was made. (Pages 40, 41.)

315—**Intangibles—Cost of Developing the Business.**

Byllesby-Arnold Statement. "It is needless to say that the physical plant of the company has no value other than second-hand or scrap-value, unless the plant is utilized for the purpose for which it is constructed, and the plant cannot be utilized for this purpose unless the business has been secured.

"In estimating this element of value, the following method has been pursued. It has been assumed, as stated before, that the property could be reproduced within a period of five years. A construction schedule has been prepared, in which dates are assigned for the construction of various portions of the property now existing. In making up this schedule the plant has been reproduced somewhat as follows:

"It has been assumed that, first, certain pieces of real estate for downtown offices will be purchased, and next, that the exchange buildings will be constructed, building space to be of the present capacity, and that central office equipment or a fraction of the present capacity will be installed as the first installation; also that the conduit lines in the given section will be built complete, and that sufficient cables will be installed with the first installation to serve the partial equipment installed in the offices. Furthermore, it is assumed that a certain number of subscribers will be obtained as soon as this equipment is ready for service, and at that time the sub-station equipment will be provided. During a later year additional offices will be constructed and additional units will be installed in the offices already partially equipped.

"An additional item of expense, which is part of the cost of securing business, is included in this schedule at this point, representing the cost of securing subscribers and printing the first issue of the directory, which amounts, as shown by study of the present operating statistics, to slightly over $4.00 per subscriber, and the total obtained by multiplying the total number of subscribers by this amount, is included in the proper column in the table.

"The schedule thus arranged provides for the completion of the entire property within five years. The amount expended during this time is the amount shown in the appraisal exclusive of carrying charge. It has further been assumed that that company has a right to earn a fair return on the amount of money invested, and during any given period in the schedule after the first period a return has been figured on the investment at the end of the preceding period." (Page 41.)

34—**Rate of Return.**

Any one familiar with the numerous decisions of rate commissioners, is aware of how uncertain and vague are most of their expressions upon the proper rate of return. The courts have been inclined to uphold any rate which yielded from 4% to 6% return. Their theory has appeared to be that if the rate was as high as bonds were netting the investor in the locality, which was usually from 4% to 5½%, the rate was not confiscatory. State commissions have held to a higher rate.

New securities in the lighting business in Massachusetts, however, have been ordered by the State Gas and Electric Light Commission to be sold at such premiums as to net the investor only 5% to 6%. . . . . The rate should be such as to keep the securities at par, or slightly above. The market for the securities of a well-known company is highly competitive. If investors are willing to buy stock on a 6% basis, and the company insists upon paying 8% dividends, the investors will quickly run up the price to such an amount, say 133 1-3, as will net the investor only 6% on what he pays for the stock. We may argue that the business is such that the investor ought to have 8%; but the investor, having his own opinion on the subject, insists upon buying on a 6% basis, or whatever may be the actual market quotation.

To all this it is urged that the stock, at least of the local company, is more precarious than the stocks of the local gas or electric light companies, because of the existence of the competition from the Illinois Tunnel Company. That competition has not been serious thus far, and the investor, judging from the above named market quotations, evidently does not expect it to be; neither do the officers of the Chicago Telephone Company express any fear from that source.

Of more force is the claim that stockholders may pay more for stock in expectation of occasionally having a chance to buy new stock issues at par.

In view of all these facts, it would seem as if 6½% to 7% were as reasonable a rate of return for Chicago Telephone stock as for the Consolidated Gas Company stock of New York, with reference to which a 6% return was considered reasonable by the United States Supreme Court in January, 1909. (Pages 57-59.)

COMMISSION DECISIONS—NEW YORK

33—Capitalization—Replacements.

Application of the New York Railways Company for approval of a bond issue before the Public Service Commission for the First District, New York.

The Public Service Commission for the First District has granted the New York Railways Company permission to issue bonds to the extent of $640,000.00, the proceeds of which are to be applied to the purchase of 175 of the new stepless cars, for use on the principal surface lines of the company's system. It is estimated that these cars will cost $6,000.00 a piece, and the company had applied for a bond issue of $1,050,000.00 to cover the whole cost. It was the plan to retire 175 of the cars now in use when the new cars were placed in service. The Commission, acting on an opinion by Commissioner Milo R. Maltbie, refused to allow the company to capitalize this replacement in its entirety, as both the law and the orders of the Commission forbid the issue of bonds for replacements, which should be paid for out of earnings. Inasmuch, however, as the old cars had cost the company about $3,200.00 a piece and the new cars were to cost $2,800.00 in excess of that, the Commission allowed the company to capitalize the difference between the old costs and the new. Allowing for the sale value of the old cars at about $800.00 a piece, the total amount permissable for capitalization was about $500,000.00. The Commission accordingly allowed a bond issue sufficient to produce this amount in cash. As the bonds are to be issued under the first real estate and refunding mortgage and will bear 4 per cent. interest, the Commission orders that they shall be sold at not less than 78, and for the discount and expense of sale allows a margin of $140,800.00, making the total issue $640,000.00. The order also provides for the amortization of this $140,800.00 by the annual payment into a sinking fund of $2,700.00.

The company, in the same application, asked for a bond issue of $550,000.00 to pay for additions to be made to its car barn at 54th Street and Ninth Avenue. As the company is contemplating the sale of another car barn at 32nd Street and Lexington Avenue, and the proposed additions to the 54th Street barn are in the nature of replacement for the 32nd Street barn, the Commission, applying the same principles as it did in the case of the cars, refused to allow the capitalization of this expenditure, and pointed out that if the sale of the 32nd Street barn is affected the company will derive sufficient funds from that source to more than pay for the contemplated improvements in the 54th Street barn.

NOTE.—In its preparation of this case the Commission developed a most complete digest of all the opinions and decisions upon the capitalization of replacements.

CURRENT REFERENCES

132—Protection From Competition.

Decision of the Wisconsin Railroad Commission, Electrical Review, Nov. 2, 1912, p. 840, and Electrical World, Nov. 2, 1912, p. 918.

The Wisconsin Railroad Commission has denied the Interstate Light and Power Company's application for a certificate of public convenience and necessity, to extend its high-tension transmission system into the town of Mifflin, where it had contracts to supply certain mines with electric power wanted immediately. The town is now without electric service, but the Mineral Point Electric Light Company, an existing company in an adjoining town, holds permits from Mifflin authorizing it to extend its present system into that district, and at the hearing, this company showed that, although no construction had yet been begun, it had been engaged for six months in preliminary work incident to construction, and complete plans for the rehabilitation of its plant, and for the extension of its system had been prepared.

The Commission, on investigation, found that both companies were in a position to furnish adequate service within a short time, and that there was not sufficient business to warrant the existence of two competing companies. It held therefore that the company holding the permits should be allowed a reasonable length of time in which to furnish the service.

2—Public Service Regulation.

Argument of Frank Bergen for Public Service Gas Company before the Board of Public Utility Commissioners of the State of New Jersey, in the hearing as to the rates of the Company for gas in the Passaic Division. Oct. 11, 1912, 113 pages.

Mr. Bergen urges caution on the part of the Commission while the matter of rate regulation is still involved in discussion and litigation. The argument is a plea for Going Concern Value, Special Franchise Value, and 8% as a fair return for gas companies. He cites the express companies as an example of value in excess of mere physical property, in that they are taxed on all of their intangible value.

32—Depreciation.

The Use of Depreciation Data in Rate-Making and Appraisal Problems. Article by Halbert P. Gillete, and editorial comment, Electrical World, 3 pages. Nov. 2, 1912, pp. 927, 909.

Discusses and gives methods of estimating natural depreciation, and that due to obsolescence and inadequacy, accident, demand and price depreciation, weighted average age of plant units, wearing value, maintenance accounts and upkeep costs; and describes the calculation of depreciation by the straight-line formula, the sinking-fund formula, and the unit-cost depreciation formula, which the writer considers more general and complete, in that it covers depreciation in addition to that calculated by the sinking fund formula,

91—Promotion of the Business.

Electricity as Future Motive Power for Steam Railroads, by E. M. Herr, Public Service, 2 pages, November 1912, p. 219.

Describes the growth in past few years of Central Stations, and points out how the great extension of electric service, and the concentration of production of energy for wide regions in one central station, by increasing the diversity of the load, and improving the load factor, will reduce the cost of electricity enormously. The steam railroads will become much greater users of electricity; electric engines have already been found of the utmost economy in terminals in large cities, and the indications are that their future use will be so widely and rapidly spread as is now not dreamed of.

91—Promotion of the Business.

Some Problems in Electrical Engineering, a paper by Charles P. Steinmetz, before the joint meeting of the Chicago Section, American Institute of Electrical Engineers, and the Electrical section, Western Society of Engineers, Chicago, Oct. 28. Editorial and news article, Electrical Review, Nov. 2, 1912, pp. 819 and 820, and Electrical World, 2 pages, Nov. 2, 1912, p. 911.

The great lowering in cost of production of electric energy, by the consolidation of electrical supply systems under a common management, with generating stations of large capacity, indicates clearly that this will be the future of the electrical business, and points to a time when these large systems will be so extended, that their networks will cover the entire country, like our present system of trunk and local railroads.

The regulation of rates by public service commissions, which have now pretty well established the cost of service as the basis for fixing charges to the consumer, ensures that the public will share in the benefits of the economies resulting from such consolidation, and thus escape the objection to the much berated trusts, which were built up when such advantages were appropriated by the promoters, one man or a small group of men who succeeded in making the combination of the various plants.

91—Promotion of the Business.

Electrical Service in Coal Regions, an illustrated article in Electrical World, 3 pages. Nov. 2, 1912, p. 921.

A description of the system of the Luzerne County Gas and Electric Company of Kingston, Pa. Electrical energy is transmitted to fourteen boroughs in the Wyoming Valley from a steam-driven station at Plymouth.

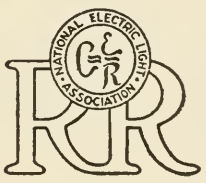
91—Promotion of the Business.

Electricity in Casket Works, illustrated article in Electrical Review, 5½ pp. Nov. 2, 1912, p. 823.

While the actual monetary saving effected by the use of central-station energy in casket works is really of secondary importance to the advantages gained, still many manufacturers require a saving to be demonstrated before the change is made. Comparative figures, taken from the books of three factories, show that such a saving can be made in the typical plant.

Vol. 2 November 13, 1912 No. 7

RATE RESEARCH



PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
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120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

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Rate Research

Vol. 2. Chicago, November 13, 1912 No. 7

754— LAMPS—RENEWAL PRICE.

On November 1st some of the large central stations, noticeably New York and Chicago, announced the following new prices on Tungsten lamps:

Watts.	Customers Entitled to Free Renewals. Plain.	Watts.	Customers Entitled to Free Renewals. Plain.
10	$0.32	60	$ .33
15	.26	100	.38
20	.26	150	.57
25	.26	250	1.07
40	.26	400	2.00
40 (large bulb)	.36	500	2.00

69— RATE SCHEDULES—MICHIGAN.

Report of Committee on Uniform Filing of Rates and Schedules to the Michigan Railroad Commission, Lansing, Mich. 32 pages.

A Committee composed of Representatives of the Michigan companies and the Michigan Railroad Commission, of which Mr. H. H. Crowell, of the Commonwealth Power Co., Jackson, Mich., was chairman, was appointed in March, 1912, and has submitted its report.

Mr. Crowell was formerly Engineer, Division of Light, Heat and Power of the Second District Commission in New York, and was a member of the Second District, New York, Committee on Gas and Electric Schedules, and this report is closely modeled after the report of the Second District Committee.

On page 3 an interesting statement of the "Fundamental Differences Existing Between the Business of Supplying Electricity and the Business of Supplying Gas, Water, Transportation and Commodities," is given.

Definitions of Classified Service and the various factors affecting rates are given on pages 4 and 5. Definitions of Methods of Charge as approved by the Second District Commission and the National Electric Light Association have been adopted.

627— OFFICIAL OR GOVERNMENT RATES.

Special Rate to State, Municipal or Federal Buildings. Very few of the Commissions have handed down decisions upon this important matter, so that the following references may be of interest.

MASSACHUSETTS.

The Massachusetts Commission has placed itself squarely on record against the special official rate as shown by the following:

> The municipal schedules, so far as they relate to the lighting of municipal buildings, contain special discounts, already described, which are not offered to private customers. The Board knows of no logical or consistent basis upon which such special discounts can be defended, and recommends their discontinuance.
>
> Edison El. I. Co. of Boston.....Mass. G. & E. R., 1909. 48.

> But that is not the real issue presented by your communication; it is rather that the Board shall now recommend that the company shall discriminate in favor of the city over all of its other customers. The Board believes that such a discrimination cannot be seriously urged on the ground of any substantial difference in cost. The two items of advertising and collection mentioned form so trivial a part of the cost of supplying electricity (probably not over a small fraction of a cent per kilowatt hour sold) as to be negligible. The Board also believes that a discrimination cannot be properly based on the school committee being "a very desirable customer of the company, because of the hours during which its buildings consume current." Other customers are equally desirable for the same reason, and no discrimination can fairly be based on this ground which does not apply to all customers in similar situation as well as to the city.
>
> For the reasons thus briefly outlined the Board is unable to require the company to make a discriminatory rate in favor of the city's buildings under your care.
>
> Edison El. I. Co. of Boston...Mass. G. & E. R., 1910. 31, 33.

NEW YORK.

In New York State, however, an amendment was put into the law so that such special rates would not be disturbed. The City of New York has had for years a special rate.

Section 66-12 of the New York Public Service Commission's Law reads as follows:

> Every electrical corporation [may be required] to file with the Commission, and to print and keep open to the public inspection, schedules showing all rates and charges made, established or enforced, or to be charged or enforced . . . *but this subdivision shall not apply to State, Municipal or Federal contracts.*

In case No. 823, order amending final order May 7, 1909, the Commission laid down the following rule:

> Sec. 12. Nothing herein shall be construed as applicable to schedules of rates and forms of contracts relating to service rendered to the City or State of New York, or to the United States government, save that every electrical corporation shall file with the Commission a copy of every contract relating to such service, made with the City or State of New York, or with the United States government, within ten days from the receipt of the signed contract by the company, but in no event shall more than three months from the date of signing every such contract be allowed to elapse before a copy of every such contract shall be filed with the Commission."
>
> P. S. C. R. 1909-II, (1st Dist. N. Y.).....244

WISCONSIN.

The Wisconsin Law requires that all rates be published in the schedules.

> Section 1797—M-33.
>
> It shall be unlawful for any public utility to charge, demand, collect or receive, a greater or less compensation for any service in connection therewith, than is specified in such printed schedules, including schedules of joint rates, as may at the time be in force, or to demand, collect or receive any rate, toll or charge not specified in such schedule. The rates, tolls, and charges named therein shall be the lawful rates, tolls, and charges until the same are changed as provided in this act.

In actual rate cases, the Wisconsin Commission considers each class of business upon its merits, as to combined load factor, etc., and makes no special rates, as such, for City or State Buildings. The following is a typical expression of the opinion of the Commission:

> COUNTY AND FEDERAL BUILDINGS. Company supplies two county buildings, a court house and jail, each with an estimated installation of 50 lamps of 50 watts equivalent. Current consumed for the year 1907 amounted to 5.517 hours daily use of total connected load, with a seasonal variation ranging from 8.653 hours use in January to 3.040 hours use in July, or a deviation above and below the average of 57 per cent and 45 per cent, respectively. The federal court house, and post office, has an installation of 375 lamps of 50 watts equivalent. The current consumed during the same year amounted to 3.252 hours daily of connected load, with a seasonal variation ranging from 4.610 hours use in January, to 2.486 hours use in June, or a deviation above and below the average, of 42 per cent and 24 per cent, respectively. Data gathered from two cities using demand meters yield ratios of consumers' demands to connected load of 33.6 and 31.0 per cent.
>
> Madison Gas & Elec. Co., 1910.. .....4 W. R. C. R. 501-698.

NEW JERSEY.

Quite recently the Board of Public Utility Commissioners has denied the application of the City of Newark, New Jersey, for a special sliding scale rate for lighting the city's 98 municipal buildings. The Board holds that no distinction should be made between the City and private consumers. (Note—The text of the decision has not been received, but will be printed later.)

222— UNIFORM ACCOUNTS—NEW JERSEY

A Tentative Uniform System of Accounts for Electric Light and Power Companies, a 75-page circular, issued by the New Jersey Board of Public Utility Commissioners, Division of Statistics and Accounts.

> This tentative system of accounts conforms very closely with the "Standard Classification of Construction and Operating Accounts for Electric Light and Power Companies" adopted by the NATIONAL ELECTRIC LIGHT ASSOCIATION, and with the uniform system of accounts prescribed by New York State for electrical corporations, and by the Interstate Commerce Commission for electric light and power companies in the District of Columbia, Section 11, paragraph 17 (d), of the above-mentioned statute specifying that any system of accounts prescribed by the Board shall conform, in so far as in its judgment is practicable, to any system adopted or approved by the Interstate Commerce Commission of the United States of America. Certain modifications of those systems of accounts, however, are embodied in the tentative system of accounts herein presented.

A copy is sent to interested parties upon request.

282— COMMISSION REPORTS—NEW YORK

Annual Report of the Public Service Commission for the First District New York, 1910. Volume IV, Statistics of Gas and Electric Companies. 665 pages.

This volume is unusually complete and satisfactory and contains statistical data and information of the New York City Electric Companies for 1909 and 1910 as obtained under the System of Uniform Accounts.

VOLUME I, 1911, 760 pages.

Contains the general report for 1911. Chapter V Gas and Electric Companies, reviews the Queensboro and Kings County rate cases. The main portion of the volume is devoted to the formal orders of the Commission.

Annual Report of the Public Service Commission Second District New York, 1911, Volume I, 980 pages.

Contains the general report of the work of the Commission, including a reference to the work of the Second District Committee on Gas and Electric Schedules (pp. 23, 48). The formal orders of the Commis-

sion and the Uniform System of Accounts for Telephone Companies comprise the main portion of the Report. Appendix A (p. 125) contains some general data as to stocks, etc., of Electrical Corporations. The following paragraph should be of interest.

832—**Municipal Operation.**

There are in the State two cities and forty-eight villages that operate municipal lighting plants. Such municipal plants are, with a few commendable exceptions, unable or unwilling to adopt the practices of modern accounting. In many instances the bookkeeping is limited to a record of consumers' accounts, and a simple statement of receipts and disbursements, with little or no attempt at analysis or classification. In some cases the affairs of the lighting plant are so inter-related to those of the water or of some other department, and the accounts of the two departments are so confused, that it is impossible to determine the actual results of the operation in either department. It is a matter of prime importance, when municipalities embark upon business enterprises, that they should adopt businesslike methods; but the citizens of many a village are convinced that their lighting service is cheap when as a matter of fact it is dear, because the lack of a proper accounting system fails to reveal the actual conditions.

VOLUME II, 456 pages, contains abstracts of reports of Steam Railroads, Electric Railroads, Express and Sleeping Car Corporations.

COURT DECISIONS.

81—**Municipal Regulation.**

Wilmington City Railway Company v. Public Utility Commissioners for the City of Wilmington. Decision of the District Court, Delaware, March 5, 1912, giving judgment for the Railway Company, and granting a temporary injunction. 198 Federal Reporter, 159.

The Company abandoned the sale of six tickets for 25 cents, and the municipal Public Utility Board, without investigation, ordered it to resume. The Company appealed to the Court, and obtained a temporary injunction from the order.

The decision says:

If the utility board and its counsel did not know what was the proper procedure to adopt, time would have been well spent in duly considering the subject, and formulating such rules and regulations, as might be necessary for an orderly investigation of the case before them, and its just determination upon the merits, instead of precipitately plunging ahead in the dark. For, as already stated, the act conferred on the utility board, power to make all needful rules and regulations for its proceedings, to compel the attendance of witnesses, and the production of books, papers, accounts and documents, and to swear witnesses and issue subpoenas. The court does not perceive that any exigency existed, which could demand or justify summary and irregular methods, in dealing with so important a matter as an adjustment of rates to be charged by the traction company.

It does not appear that any member of the utility board possessed experience, special training, or information, rendering him competent, in the absence of proper evidence laid before him, to form a reliable opinion upon the reasonableness or unreasonableness of "a straight five-cent fare." . . .

Cost of maintenance, change in wages, and a variety of other circumstances may fully justify such increase in price. Clothed with ample power fully to investigate the merits of the case, and do equal justice between the parties, the utility board allowed itself to be led into a course of action which was the antithesis of "due process of law."

283— COMMISSION REPORTS—WISCONSIN

The following rulings on electric rates are from the Index-Digest of Wisconsin Reports Vol. VI, mentioned on page 84 of RATE RESEARCH.

42—Measurement of Demand.

The commercial lighting meter rates proposed by the applicant in the present case comprise a readiness to serve charge per active unit, and a current charge per kw. hr. The application differentiates between residence and business consumers by providing that only 65 per cent of the active load of residence consumers shall be subject to the readiness-to-serve rate. The theory upon which this differentiation is made, appears to be that the residence consumer generally uses only a part of his installation at one time, while the business consumer ordinarily uses the whole or greater part of the installation at once. This variation between residence and business consumers is, however, taken care of by assuming the average active load itself to be 60 per cent for business consumers and 35 per cent for residence consumers, and there seems to be no ground for any further reduction in favor of residence consumers.

Durand Light & Power Co., 1911..6 W. R. C. R., 334, 346, 347.

42—Measurement of Demand.

The proposed power rate in the present case recognizes the existence of a difference in the ratio of active to connected load, as between small and large installations. This difference is allowed for by the company by a difference in the fixed rate per connected horse power instead of by a uniform fixed rate based on different percentages of the connected load.

Red Cedar Valley El. Co., 1911....6 W. R. C. R., 717, 762.

51—Cost of Service.

As has been pointed out many times before, the total expenses of an electric plant are not in all cases directly proportional to the output of the plant. Certain expenses are entirely independent of the amount of current sold, and a sound theory of rate making requires that these latter expenses, known as capacity expenses, should be paid by the consumer, not in proportion to the current used by them, but in proportion to the maximum demand which each consumer makes upon the capacity of the plant. The expenses which vary with the amount of current sold, on the other hand, or the output expenses, are properly met by a rate which makes the consumer's bill vary directly with the amount of current he uses. In the present case these principles are recognized by the applicant in the rate schedule which it seeks to put into

effect, for it provides a "readiness-to-serve" charge based upon the amount of the consumer's installation, plus a current charge for current actually used.

Durand Light & Power Co., 1911..6 W. R. C. R., 334, 339, 340.

By combining the capacity cost as it varies for different lengths of use, and the uniform output cost, we arrive at the costs per kilowatt hour.

Durand Light & Power Co., 1911....6 W. R. C. R., 334,345.

A large demand upon the station, with a short period of use, represents a relatively high cost of service per unit of energy consumed, because the expense which is occasioned to the utility in being prepared to meet the large demand is a large proportion of the total cost of service for the short period and for the consequent small consumption. On the other hand, small demand and large use usually cause the cost of service to approach the lowest possible point.

Red Cedar Valley El Co., 1911....6 W. R. C. R., 717, 735.

51—Cost of Service.

The annual commercial lighting expenses which are proportional to the output of the plant, should be divided among the various consumers in proportion to the quantity of energy consumed, irrespective of the size of the consumer's installations. As various losses occur in transmitting current from the power plant switchboard, where it is first measured to the consumer's premises where it is used, the number of units delivered for use is always less than the number generated. This loss is energy used in transmitting current to distant places and is as much a cost of service as other operating expenses. It is practically impossible to determine the amount of current which each consumer uses at the plant switchboard and measurements of the use of current are customarily made at the premises where the current is consumed. In order to adequately meet those operating expenses, which are proportional to the output, the unit rate therefor should be determined from the quantity sold.

Red Cedar Valley El. Co., 1911....6 W. R. C. R., 717, 756.

51—Cost of Service—Consumer Cost.

Consumer costs include expenses that are incurred because of the fact that the consumer is in a position to use current if he chooses to do so. In the present case the following items were included: Maintenance of meters, commercial expenses, taxes on meters, depreciation at 7% on meters, interest at 7% on meters, taxes on services, depreciation of services at 5%, interest on services at 7%.

Lancaster Electric Light Co....6 W. R. C. R., 53, 56.

The following consumer expenses per meter per year are fairly representative of average costs for all class B electric utilities reporting the items included: Maintenance of meters, $0.50; customer's premises expenses, $0.34; collection expenses, $0.73; interest on meters and services at 7% on $14, $0.98; depreciation on meters and services at 7% on $14, $0.98; total, $3.53. In this case the consumer expenses are about $0.30 per metered consumer per month. To this may be added 20% of the general expenses reported, which is about the proportion incurred directly by the consumer. Although these items may not represent the actual cost in the present case, they are fairly representative of costs per metered consumer for smaller electric utilities.

Greenwood Mun. Lt. Plant, 1910....6 W. R. C. R., 60, 62.

51—Cost of Service—Capacity Cost.

The capacity cost per kilowatt of active load remains fixed, regardless of the hours of use, and therefore the cost per hour will decrease as the number of hours of use increases.

Durand Light & Power Co., 1911....6 W. R. C. R., 334, 345.

51—Cost of Service—Output Cost.

The output cost per kilowatt hour is the same per kilowatt hour of use, no matter how many hours the installation is used.

Durand Light and Power Co., 1911....6 W. R. C. R., 334, 345.

611—Flat Rates.

There is no doubt that the flat rate consumers are somewhat more expensive to the plant than metered consumers, for the reason that in many cases flat rate consumers will leave their lights on all night, or, at least, will use very much more current than they would use if they were upon meters. From the data at hand, in the present case, this extra expense to the plant cannot very well be estimated, but the fact that it exists should be borne in mind in comparing flat and meter rates.

Durand Light and Power Co.....6 W. R. C. R., 334, 348.

612—Meter Rates.

The cost of service is not the same per unit for all consumers, but there is considerable divergence between the charges which should be made to long and short hour users. When a uniform net meter rate per kw. hr. is applied to all use of current, considerable injustice is done as between various consumers.

Red Cedar Valley El. Co., 1911....6 W. R. C. R., 717, 758, 759.

A method, somewhat different, may be followed in determining the rate to be charged for commercial lighting in case the rate

is to be applied only to the quantity of current used. The annual capacity expenses for commercial lighting divided by the active commercial lighting load of kws. gives an annual unit capacity charge per active kw. To determine the capacity charge for one hour's daily use of the active load, the annual charge should be divided by 365, for two hours' daily use by 730. When these charges are combined with the uniform output cost, the rates per kw. hr. for various lengths of use of the active load are obtained.

Red Cedar Valley El. Co., 1911....6 W. R. C. R., 717, 758.

613—Demand or Two Charge Rate.

As short hour customers make a much smaller use of the plant and equipment that has been provided and is maintained for them, than long hour customers, it also of necessity follows that the former are relatively more costly to the plant. Such differences in the cost should be made up by corresponding differences in the rates. If not so made up, some will be charged lower rates than they should bear, while for others the rates will be too high. Such discriminations should be avoided whenever possible, because they are unjust as between the various classes of the consumers, and are also likely to retard the development of the business of the plant.

Milwaukee Electric Railway & Light Co..6 W. R. C. R., 64, 68.

The rate which the company in the present case seeks to put into effect would make a fixed charge per active lamp to cover output cost. Since the capacity cost of the commercial system has been determined, the fixed cost to the company per active lamp may be found by dividing the capacity cost by the number of active lamps. The number of lamps which are to be considered active varies greatly with conditions. For the purposes of the present case, however, in the absence of such data as would show the actual part of each consumer's load which is active, it may not be far wrong to assume that 60 per cent of the business installations and 35 per cent of the residence installations are active.

Durand Light & Power Co., 1911....6 W. R. C. R., 334, 344.

613—Demand or Two Charge Rate.

The proper charge for lighting service in the present case should be a fixed charge per month per active 50 watt unit, plus a charge per kw. hr. for current used.

Red Cedar Valley El. Co., 1911....6 W. R. C. R., 717, 758.

Rulings on Minimum Charges, Power Rates, and Reasonableness of Particular Rates will be given in a later number of RATE RESEARCH.

LOAD FACTORS AND RATES.

453—Load Factors.

LOAD FACTORS AND RATES, a paper compiled by the Bureau of Statistics and Accounts, Public Service Commission for the First District New York, ADNA F. WEBER, CHIEF STATISTICIAN. Volume IV, Annual Report, 1910, page 14.

Continuous Use Desirable.—The utilization of full productive capacity continuously, day by day and year by year, is the ideal limit of industrial efficiency for fixed capital. For human beings the criterion of perfect economy would be very different. Even for the material instruments of production, maximum economic efficiency may require something less than absolutely continuous use. Machines as well as men appear to need rest. Repairs at least must be provided for by occasional suspension of use. But with human endurance and the conditions of demand ideally favorable, so much more use could be got out of a fixed investment than is obtained at present that, for practical comparative purposes, in order to get the potential output of a machine or plant for a day or a year, we may multiply the number representing capacity by the number representing time, disregarding the necessity of occasional breaks in the continuity and completeness of operation.

Economic Limitations to Use.—The reasons why machines are not utilized all the time to their full capacity are economic. Physical or mechanical limitations play so small a part that for present purposes they may be simply disregarded. Breakdowns and periodical overhaulings could be largely reduced or the stoppage and delay incident to them done away with if intervals of reduced utilization were not inevitable. They could be provided for statistically by distinguishing between the rated capacity of a plant and its actual working capacity for a given period. This distinction, however, is of so little practical importance that there are now no recognized and accepted standards according to which actual working capacity for a month or year may be computed.

Engineering Efficiency.—Perhaps the difference between rated capacity and actual working capacity is now tending to disappear. Modern technology is making uninterrupted use of certain engines for long periods possible. But until the economic obstacles to continuous use are done away with, the arbitrariness of the accepted methods of determining rated capacity need occasion no trouble. Somewhat arbitrary physical measures that are clear and intelligible are of more use for statistics than theoretically better measures not easily applied. Careful studies of the relation between rated capacity and actually available capacity for periods of varying length, it is true, would be well worth while.

Adjustment of Capital to Demand.—The economic adjustment of fixed capital to demand is the question here to be considered. It is practically convenient but not exactly in accordance with facts to assume that it makes no difference as regards the amount of investment whether needed capacity is fixed by a brief peak or by a continuous demand. A given physical capacity intended to be available only for a short period of maximum demand may be obtained by a somewhat smaller investment than if intended to meet a continuous demand, provided attention be given to economies directly related to the incidence of the load factor. In other words, the peak may be provided for by cheap and inefficient supplementary machinery not regularly used. But the larger investment required for a plant economically providing for continuous operation would be insignificant as compared with the gain

from nearly constant demand. A more uniform rate of manufacture, moreover, tends to reduce operating costs per unit at the manufacturing plant. Thus it is on the whole fair to assume that, other things equal, investment is proportioned to capacity and that there is no practicable way of providing for demand peaks except by making an investment that is at other times unutilized.

Limitations.—Limitations due to the somewhat arbitrary and seemingly unsuitable nature and meaning of rated capacity will not be further considered. Fundamentally it is general economic causes that make it impossible to utilize all instruments of production continuously and fully. In what situations do these causes operate and what are the available numerical indices of their importance? These indices are called load factors. The standard load factor is for the present sufficiently described as the ratio of average to maximum demand. For demand, "output" or production (gas) may be a sufficient substitute for comparative purposes.

Storage.—The relation of demand to capacity is simplest and most satisfactory when at every moment it fits into and equals capacity to supply. But an exact fit is scarcely conceivable. So far as demand falls short of this, the burden of fixed charges upon the consumer must be increased unless an adjustment of the rate of supply can be effected by absorbing and releasing at will parts of the supply on their way between producer and consumer. If the product can be stored at no cost the conditions of varying demand are easily dealt with. If it cannot be stored, variation of demand is all-important. Material goods can usually be stored, though never without cost, and the period of storage is subject also to other limitations. Services in general cannot be stored. Hence the really difficult problem of utilizing a fixed investment to the full occurs when the utility supplied is a service or process instead of a thing. For present purposes this line need not be drawn scientifically. It does not matter that the thing or material good is valued only for its processes or "services." If it is the thing that is supplied commercially rather than the service, or vice versa, the situation in relation to demand is greatly affected. Load factors are of special interest wherever the commercial product is a *service* rather than a material good.

Load Factors in Various Utilities.—There are various gradations of dependency on demand within the "service" class of cases. Public-service corporations are the conspicuous group in the class. Street railways and other carriers, electric light and power enterprises, waterworks, and gas companies are in this situation in varying degrees. Gas companies supply a material commodity, not a service; but the fact that this commodity, like a service, must be consumed in connection with the plant that supplies it, puts them in much the same class with the others. They, together with water companies, are an interesting intermediate case. Perhaps it is in the passenger business of common carriers that fluctuations of utilization most directly reflect demand and are most completely at the will of the consumers. But it is among electrical companies that the explicit use of load factors has developed. Hence a discussion of load factors as such naturally deals with them. The situation of gas companies, however, also helps to illustrate the same principle under somewhat different conditions.

Seasonal Fluctuation.—Capacity to supply cannot vary coincidentally with demand. In the rather favorable situation of a gas company the diurnal variation of demand can be provided for by storage. But there is also a seasonal variation of demand. Both variations are regular and predictable, but it is practicable to provide for only the first by storage. The holders will contain one day's supply, more or less. But the maximum day's requirement

may be three or four or five times the minimum. If the maximum is twice the average, the productive capacity must, since the maximum day may be presumed to be one among several successive days showing nearly as great demand, be nearly twice as great as the company can, on the average, utilize. This allows nothing for reserve capacity to provide for growth of business in the immediate future. Interest is not the only charge affected, but a seasonal fluctuation as great as the one mentioned doubles the burden of that item.

Production and Average Demand.—The strain of the diurnal variation of demand, which can be provided for by storage in the case of gas, must be borne directly by the generators of an electrical company. This is one reason for the great difference between the ratio of productive capacity to average daily consumption in the gas industry and in the electrical generating industry. At the close of 1910 the 24-hour productive capacity of gas manufacturing plants in New York City was 229,450,000 cu. ft. and the average daily production during the year was 114,806,000 cu. ft. For electrical companies the capacity in kilowatts was 227,667 and the average hourly production 59,950 kilowatt hours. The productive capacity was thus only twice the average demand for gas, while it was nearly four times the average demand for electricity. The difference would be greater were it not possible to provide for an electrical peak by overloading the machines for a short time. As to how great the overload may be, much depends upon the kind of prime movers in use. Turbine engines are most flexible. Some plants can well take care of of a momentary peak of even 100 per cent. The Standardization Rules of the American Institute of Electrical Engineers recommend overload capacities of 25 per cent for two hours for the most important classes of electrical equipment.

Losses.—Steadiness of demand, and therefore the load factor, is also important in relation to losses in distribution. Leakage is a considerable element in the cost of distributing gas. It is so great in the distribution of electricity as to be one of the chief practical questions with which the planning of central electric light and power plants has to deal. One-third of the electricity generated may be "unaccounted for." These losses are not proportioned to the amount consumed, but are proportioned rather to the extent of the transmitting and distributing plant and to the time during which the wires are charged or the pipes filled. But the consumer must pay for the losses as a part of the cost of the service. For a distribution system of a given construction and delivery capacity per hour, e. g. 1,000 units, the loss will be a certain amount per day, say 500. If the demand could be absolutely even and constant and up to the capacity of the system throughout the 24 hours of the day, the loss would be hardly more than 2 per cent of the amount consumed, which is a burden scarcely worth considering. But if the consumers take only 4,000 units a day, the loss increases the necessary average cost by 12½ per cent. Yet the demand may be so distributed that in order to supply the 4,000 units a system of 1,000 units per hour capacity is absolutely necessary. The loss element in the operating cost of keeping an electrical system charged at all times, whether there are few or many consumers, is a large part of the burden to be borne. The ordinary load factor indicates the necessary extent of that burden. Hence this loss, though it relates to operating expenses, may well receive passing mention in a discussion of the more essential significance of load factors for investment rather than for operating costs.

Note.—This article will be continued in the next number of Rate Research. Paragraph headings are not in original.

CURRENT REFERENCES

129—Default in Public Service—Discrimination.

Municipal Appeal to State Commission, editorial and news item, Electrical Review, November 9, 1912, pp 866, 887.

A company competing with a municipal plant, cut its prices below those of the city company, and below its own prices in adjoining towns. The municipal company charged discrimination, and petitioned the commission to compel the company to raise to the old rates. The commission is, however, unable to interfere, as regulation of rates in municipalaties is, under the law, the function of the municipal government. This feature is a serious defect of the California law.

2—Public Service Regulation.

Public Service Commissions, an address by D. L. Gaskill, Secretary of the Ohio Electric Light Association, before the Annual Convention of the Indiana Electric Light Association, Oct. 30, 31. Electrical Review, Nov. 9, 1912, p. 892, and Electrical World, Nov. 9, 1912, p. 978.

Discusses the advantages of state regulation, and recommends features to be secured in the law which will probably be enacted soon in Indiana, to establish a public service commission. The author states grounds for his conviction that fair and equitable commission control, is a blessing to the utility companies, as well as to the public.

31—Valuation.

Valuation of Public Utilities, by Commissioner Halford Erickson, of the Wisconsin Railroad Commission, a 43 page pamphlet, reprinted by the Commission for general distribution.

This is a thorough and authoritative discussion of the subject of valuation; the different methods of making appraisals are treated, and every element of valuation is dealt with. All men holding responsible positions in public utilities, will agree with the author's statement, "With the advent of government regulation of public utilities, the question of the valuation of the property and business of such utilities, has risen to a place where it must now be regarded as one of the important questions of the day."

313—Prices.

October Prices of Engineering Materials. Price changes and the business outlook. Engineering News, Nov. 7, 1912, p. 307.

453—Load Factor.

Value of Off-Peak Loads to Central Stations, a paper by Alex D. Bailey, read before a meeting of the Commercial Division of the Commonwealth Edison Section of the National Electric Light Association, Chicago, Oct. 24. Electric Review, Nov. 2, 1912, p. 822.

This paper treats the problem of load variations from the interesting viewpoint of the station engineer. Experience shows that the cost of production varies, to a great extent, with varying load conditions. Many practical suggestions were offered for lessening the unevenness of load. It costs nearly six times as much per kilowatt-hour to generate at low load, than when working under nearly full-load conditions.

51—Cost of Service.

THE COST OF POWER, a 54 page pamphlet by SETH A. MOULTON, reprinted from the Second Annual Report of the Maine State Water Storage Commission, Augusta, Maine, 1912.

The author's conclusions are based on several years experience in connection with engineering investigations of certain water power developments. The paper was prepared with a view of aiding in the education of the public, in regard to the value of Maine's water powers, and to dispel the illusion of the possibility of generating steam power, in Maine, at $15 to $16 per horse-power year of 3,000 hours, except when steam is used also for process or heating purposes.

Sections of the paper are devoted to: Classes of Power; Efficiencies, with diagrams, Measurements and Terms; Factors; Cost of Foreign and American Water Storage Reservoirs; Cost of Installations; Cost of Fuel per Horse-power Hour; Coal, Producer Gas, Oil; and Depreciation, Repairs and Improvements.

62—Character of Service.

POWER REQUIREMENTS OF ROLLING MILLS, by WILFRED SYKES, a paper presented under the auspices of the Industrial Power Committee before the meeting of the American Institute of Electrical Engineers, New York, Nov. 8, 1912. Prodceeings, Nov. 1912, p. 2017.

While this is an engineering article, such articles throw light upon the various kinds of service required of the central station.

62—Character of Service.

ELECTRICITY IN MATTRESS MANUFACTURING, illustrated article. Electrical Review, 6½ pages, Nov. 9, 1912, p. 871.

Owing to the excessive amount of lint and dust inseparable from mattress-manufacturing processes, motor drive is the logical method of operation, as it greatly reduces fire risk, and cost of maintenance. Also, as is shown, central station energy effects a considerable saving over steam power. Operating data from nine plants are presented in the data sheets.

621—Small Lighting.

PRESENT PRACTICE IN SMALL STORE LIGHTING WITH TUNGSTEN FILAMENT LAMPS, a paper by Clarence L. Law and A. L. Powell. Transactions of the Illuminating Engineering Sociaety, 30 pges, Oct. 1912, p. 437.

This interesting paper, which was noticed in 2 R. R. 76, is now given in full in the above transactions, with twenty illustrations, and the discussion by others present at the convention of the Illuminating Engineering Society, where it was first read.

69—Rate Schedules.

Light and Power Rates of Seattle Municipal Plant, by J. D. Ross, Journal of Electricity, Power and Gas, 3 pages, Sept. 14, 1912, p. 235, and correction by W. J. Grambs, Journal of Electricity, Power and Gas, Oct. 19, 1912, p. 340.

Gives the rates for residences, street lighting, business and power, with charts showing rates for business and power loads, and earnings.

98—Public Relations.

WINNING THE PUBLIC; STUDY THE PUBLIC'S GOOD; WORKING WITH THE PUBLIC; three articles by WM. H. HODGE, of H. M. Byllesby & Co., which appeared in the Chicago Evening Post, Sept. 21, 28 and Oct. 5, 1912.

These articles explain in a general way how the modern utility is encouraging a friendly public sentiment.

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RATE RESEARCH

PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
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120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

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For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

619—RATE DIFFERENTIALS—MINIMUM CHARGE.

There was a newspaper report current in Arizona, that the State Corporation Commission had made a ruling against minimum charges by corporations. This, however, is not the case, as the following statement by Mr. W. P. Geary, the Chairman of the Arizona Corporation Commission, shows:

> "The last session of the Legislature provided by statute that gas, electricity and water measured through a meter, would be charged for, according to the exact amount used, and that no other charge should be made. This, however, does not meet with the approval of the Commission, and we expect that when the Legislature again convenes, (probably this month), this law will be amended so as to permit a minimum charge being made."

The effort to establish rates which would yield about an equal return as by the use of a minimum charge, was made by some utilities; a specimen of a schedule of water rates by the Nogales municipal plant, shows the complicated and unsatisfactory result.

150	gallons	per	month	at	$ .01		per	gallon	$1.50
300	"	"	"	"	.00533		"	"	1.60
500	"	"	"	"	.0034		"	"	1.70
1000	"	"	"	"	1.85	per 1000	gallons		1.85
1500	"	"	"	"	1.33 1-3	"	"	"	2.00
2000	"	"	"	"	1.07½	"	"	"	2.15
2500	"	"	"	"	.92	"	"	"	1.30
8000	"	"	"	"	.81 2-3	"	"	"	2.45

and so on up to 30,000 gallons.

The Arizona Weights and Measures Law, 1912, reads as follows, page 23:

> "Chapter II, Sec. 7. It shall be unlawful for any person, firm or corporation, to sell and deliver, charge and collect for, or pay for, water, electrical energy, or illuminating gas, used or to be used for lighting, heating, or other commercial or domestic purposes, except by meter measurement, if the consumer shall request that the same be sold by meter measurement; or to charge and collect for, or pay for, a greater amount of such water, electrical energy, or illuminating gas, than actually furnished during the period for which the charge was made; provided, however, that an allowance of not exceeding three per centum (3%) may be made for inaccuracy in meter measurement."
> (Chapter 91 Session Laws First Legislature).

EDITORIAL NOTE.—All indented matter is direct quotation.

5— RATE THEORY—INTERSTATE COMMERCE COMMISSION.

Railway Rate Theories of the Interstate Commerce Commission, by M. B. Hammond, Professor of Economics and Sociology, Ohio State University. Harvard University Press, Cambridge, 1911. 200 pages.

The following paragraphs in relation to the decisions of the Interstate Commerce Commission, have interest because of their bearing on electric rate matters:

34—Rate of Return.

So far as a general schedule of rates is concerned, therefore, it may be said to be the opinion of the Commission, that these rates may be only high enough to earn a fair return upon a *legitimate* investment of capital, in the construction and operation of the road. Page 181.

One other alternative has been presented to the Commission, in certain cases where it has been unable to calculate the costs of service, and this, too, has been in accordance with well-known economic principles. What the economist always means by *cost price*, is that price which covers, not only actual expenditures made in production, but which also leaves a *normal rate of return upon all the capital invested.* In those cases, therefore, in which the Commission has been called upon to deal with a whole system of rates; where it would have been clearly impossible to have calculated all the costs; where even the comparative method was lacking, because the increase of rates had been made general, and where competition was not present,—it has still been possible to ask whether these rates have yielded the same results, measured by their effect on earning power, as would have resulted if the cost of service principle had been applied. Pages 189, 190.

. . . . . .

Railway rates as a whole, should just cover costs as a whole, allowing for a normal rate of return on capital actually invested, a normal return for labor of all sorts, and for depreciation, but not for betterments. This would not mean that superior efficiency in railway management, was not entitled to reap the rewards of its superiority, in the same way it does in the ordinary industrial establishment, where competition rules. On the other hand, the rule must not be construed to mean that any investment in a railroad, no matter how foolishly or recklessly made, is entitled to exact high rates, from persons and industries along the line in order to earn current interest rates or dividends. Railway property is not more sacred than other property, nor are railway investors immune from the consequences of their own acts. Page 193.

513—Return for Different Character of Service.

A charge made for hauling a particular commodity, or for the performance of a specific service, may not properly be judged by the same standard, as is applied to an entire rate schedule. Some rates need to be lower, while others may properly be higher, than the average rate needed to yield a fair return upon the capital investment. In the case of the Central Yellow Pine Association v. The Illinois Central Railroad et al., the Commission has well explained why, in measuring the reasonableness of a rate on a given commodity, different standards must be applied, than are used to measure the reasonableness of an entire system of rates. Pages 181-182, 529.

55—Value of Service Theory.

The Commission began its work with the idea that *value of service* was the underlying principle of railway rates. It was unable, however, to furnish such a precise definition, or explanation, of this term, as would enable it to be used as a concrete measure of a reasonable rate. How uncertain is the meaning of the phrase, and how different may be the interpretation of it, given by the railway manager, from that which the Commission clearly had in mind, is shown by the use made of it, to defend the rate on cotton, charged by one of our southwestern roads. The vice-president of the road had stated before the Commission, that the rate in question had been made in accordance with the principle of "the value of the service." Upon being asked to explain the method of applying the principle in this case, he replied that two rules had been followed by his company: (1) "To give [secure] the largest revenue the traffic will bear"; (2) "to find a market for the stuff." Keeping both these principles in mind, he declared that "any rate is reasonable under which traffic will move absolutely. It all moves out every season. If it moves out, it must be a reasonable rate." Pages 186, 187.

If this pragmatic explanation of what constitutes a reasonable rate, be accepted as a fair indication of what we may expect when rates are fixed according to value of service, it is plain that we shall find that value of service, is merely equivalent to the well-known monopolistic principle, of charging that price which will yield the highest net return. It is also evident, that the Interstate Commerce Commission could never consent to the use of such a principle, as a basis for determining reasonable rates. Page 187.

51—Cost of Service Theory.

The great advantage which *cost of service* has over value of service, is that it furnishes a concrete standard of measurement. It states a *quid pro quo* as a reason for making the charge. It is the standard of reasonableness which has been adopted in all our economic relations. To make charges less than costs, would mean that other commodities, or other industries, would have to make up the deficiency, or else the railroads of the country would run at a loss. To charge

more than costs, on the other hand, would mean that the railway industry, was forcing other industries, to surrender to it, a portion of their legitimate earnings. The fact that it is universally accepted in other transactions, as a test of reasonableness, explains why the Commission has naturally turned to a consideration of costs, when the equity of a given rate has been brought in question, and it also explains why railway officials have naturally made cost of service, their defense whenever their rates have been attacked. Page 187.

If the conclusion be accepted, which these articles seem to support, that the tendency of the Interstate Commerce Commission's decisions is, on the whole, towards a cost of service theory of rate making, there still remains the task of so stating a theory of rates, as to bring in the various considerations, which we have seen the Commission has emphasized as factors in rate making, and show how they can be related to the fundamental principle. It is perhaps well to say, that nowhere has the Commission undertaken to state such a comprehensive theory of rate making. Page 192.

132—Competition.

Even in the absence of these indirect methods of determining costs, the Commission has found it possible to reach the same goal by other methods. It is a fundamental principle of economics, that free and untrammeled *competition*, operating over a long period of time, tends to reduce prices to a cost basis. We have, therefore, only to apply this principle to railway rates, to see that rates which have been fixed by competition, provided that this competition has been of a normal sort, will be the same as they would be if all the costs of service had been calculated, and rates had then been based on costs. In spite of all the inconsistencies and contradictions involved in the Commission's discussion of competition,—many of which, as we have observed, are due to an effort to preserve the spirit of the law,—we see running throughout the Commission's decisions, a tendency to fix rates at the point where a normal and healthy struggle between competing interests, has tended to leave them. Competitive rates are therefore true to a cost of service principle. Page 189.

511-512—Apportionment of Investment and Expense.

Each commodity transported should, as far as possible, be made to defray its own share, not only of operating and terminal costs, but also of the fixed costs and dividends. It is possible under modern accounting methods, to determine these costs with an approximate degree of accuracy, for the principal commodities and classes of traffic. The rates on other commodities, may be determined by comparing their ascertainable costs, with those of the principal commodities, and to a lesser extent, by a comparison of the relative values of the commodities. Pages 193, 194.

COMMISSION DECISIONS—MASSACHUSETTS

626—Street Lighting.

Mayor of Malden (pop. 44,404) v. Malden Electric Company, complaining of street lighting rates. Decision of the Board of Gas and Electric Light Commissioners, Oct. 23, 1912, reducing the rates. History of the case:

> The contract for street lights between the city of Malden and the company expired in June, 1911, but the company has continued to operate the same lamps, under the same conditions. . . . Since June 30, 1911, the company has charged the city $96 a year for each arc lamp, $20.80 for each all-night incandescent, and $18.30 for each dark-hour incandescent. . . .
>
> The business of the company has been steadily increasing, and during the past five years, its earnings have been more than sufficient to cover its expenditures for repairs and renewals, dividends to its stockholders, and such allowance for depreciation as the management has deemed advisable. . . .
>
> During this period, while the prices for street lamps in Malden have remained unchanged, the company has reduced its maximum net price of electricity, from 15, to 13 cents on August 1, 1909, to 12 cents, on July 1, 1910, and to 11 cents, on July 1, 1911.

Decision:

> The Board recommends that, on and after the first day of November next, the price . . . of arc lamps, . . . shall be not more than $85 per lamp per year; the price of . . . incandescent street lamps, . . . shall not be more than $18 per lamp per year; and the price of . . . incandescent street lamps, burning not less than 3,100 hours a year, . . . shall be not more than $15.50 per lamp per year.

34—Rate of Return.

> While the Company is entitled to a fair return upon the property, which it is actively and necessarily employing for the public convenience, the income from its entire business is ample to justify the extension, to the street-lighting rates, of the same policy of price reduction, that it has applied to its commercial output.

51—Cost of Service Theory.

> For reasons which the Board discussed at length, in its recent decision as to the price of street lights in Worcester, it seems neither practicable nor desirable in the present development of this company's business, to undertake a determination, which must necessarily depend upon many purely theoretical considerations, of the cost of supplying the street lamps, separate and apart from the cost of other divisions of the company's business. . . .

COMMISSION DECISIONS—WISCONSIN

Application of the Bruce Water and Light Commission, (Bruce, pop. 612), for authority to increase its rates, tolls and charges, by changing a moving picture arc, from power to lighting rate. Granted. Decision of Wisconsin Railroad Commission, July 23, 1912. 9 W. R. C. R. 474.

62—Character of Service.

Held: The question at issue is one of classification of consumers rather than of power rates. Under the circumstances, the moving picture arc should take the lighting rate. The cost of service for such an arc, is about the same as for general illumination, especially where the electric plant is operated only at night, as in the present case, and where the use of the arc is entirely limited to the hours of commercial lighting. It is ordered that the applicant may classify moving picture arcs, to which it furnishes current, as lighting consumers, and charge for such current at lighting rates.

72—Special Service Charges.

In the present case, consumers whose meters are owned by the utility are required to pay a monthly minimum charge, while those who own their meters, are exempted from the payment of any minimum. This feature of the schedule is in violation of the Public Utilities Law. It is the duty of the utility to furnish meters, and no distinction, as far as rates, or minimum charges are concerned, can be made between consumers who own their meters, and those whose meters are owned by the utility. Steps should be taken to remove this illegal feature of the schedule at once.

613—Demand or Two-Charge Rate.

Application of the Whitehall Municipal Electric Plant (Whitehall, pop. 600) to increase its rates. Granted. Decision of the Wisconsin Railroad Commission, July 24, 1912. 8 W. R. C. R. 479.

Application was made by the village of Whitehall, Wis., for authority to increase rates for electric current. Applicant's electrical property consists of electrical equipment, and a distribution system. Hydraulic power to generate current, is purchased of the Whitehall Mill and Power Company. Revenues and expenses were examined, and operating expenses were apportioned over capacity and output expenses. Capacity expenses were further apportioned to the different classes of service, on the basis of the contribution each makes to the station peak, and the output expenses, on the basis of the amount of current used by each class. Based upon data submitted by the utility, and comparison with other plants, total expenses were apportioned among metered consumers, flat rate consumers, and street lighting.

Held: An advance in rates is reasonable, and applicant is ordered to amend its present schedule, and to put in effect the rates prescribed by the Commission.

COMMISSION DECISIONS—NEW JERSEY

619—Rate Differentials—Minimum Charge.

Mayor of Ocean City (pop. 1,950) v. City Gas Light Company, charging violation of city ordinance. Decision of New Jersey Board of Public Commissioners, abolishing minimum charge. July 19, 1912.

History of Case—The ordinance specified a straight-line meter rate, on which ground alone, the Commission abolished the minimum charge. It held, however:

619—Rate Differentials—Minimum Charge.

> At the same time, the Board would strongly recommend both complainant and respondent to get together, and to replace the existing ordinance by a new agreement fair to both alike.
>
> It is pretty generally agreed today, that a properly constructed schedule of gas rates, will combine two different kinds of charges, a minimum charge, and a charge graduated by consumption. A gas company has two different kinds of expense. The first, consists of the charges arising from having built, and having to maintain, a plant, and delivery system. This charge, is largely independent of the quantity of gas consumed. It would exist, if no gas at all were consumed for a time. The other kind of charges, for fuel, labor, etc., will vary, largely with the total product manufactured and delivered. A fair minimum, guarantees a return on plant built, maintained, and held in readiness to serve. A fair charge for the amount of gas consumed, affords a return for the second class of expenses. A proper schedule will combine both minimum charge, and a metered consumption charge, and is fairer, and more advantageous, in the long run, to both consumer, and producer, than the ordinance provision now operative in Ocean City.

76—Termination of Service.

Thomas J. Murphy v. Coast Gas Company, Belmar (pop. 1,433), complaining of peremptory cutting off of service. Adjusted by the New Jersey Board of Public Utility Commissioners, without formal order, Sept. 20, 1912.

> The complainant averred, that his supply of gas was peremptorily cut off on August 15th, 1912; and that the defendant's reason for this action, was the complainant's failure to pay a bill, rendered by the respondent, for gas consumed in 1910.
>
> Upon hearing, it appears to the Board, that a bill long overdue (as in this case, for a period of two years), which was originally protested, and, which has long been subject of dispute, cannot be properly urged as a good reason for discontinuing service at this late date. Especially is this the case, when the company has supplied service subsequent to the dispute over the bill, and has failed to bring legal action to enforce whatever may be its just rights in the premises.

The question emerges, whether, under the principle herein enunciated, gas companies are not left exposed to any unscrupulous customer, who may trump up a dispute, to evade immediate payment of bills due, and then decamp to other jurisdictions, before the dispute can be determined. The respondent alleged, that this danger is a real danger in seaside resorts, with their large non-resident summer population. To this query, the answer seems sufficient, that a reasonable deposit in advance (with interest thereon allowed the depositor), seems to furnish good guarantee against losses such as might result in the circumstances indicated. Where gas companies do not require a deposit, the reasonably prompt payment of admittedly due bills for gas, may be enforced by a prompt cessation to furnish service. But the payment of back bills bona fide in dispute, where the company by subsequent furnishing of service has admitted the legitimacy of a difference of opinion as to the bill in question, cannot be enforced by shutting off service.

COMMISSION DECISIONS—CALIFORNIA

31—Valuation.

Decision of the California Railroad Commission, in the matter of ascertaining the value of the property of the electric railroad corporations, within the State of California. Oct. 17, 1912.

Be it ordered, that each and every company, owning and operating an electric railroad in this State, shall prepare, and file with this Commission, at its office, in the City and County of San Francisco, State of California, on, or before, one hundred and twenty (120) days from the date of service of this order, on each of said companies, respectively, inventories, and appraisals of the cost, and value, of their property, in the State of California, upon printed blank forms, marked forms Nos. 1 to 49, inclusive, which will be furnished by this Commission, with this order. . . .

It is further ordered, that each of said electric railroads, shall prepare, and file with this Commission, within sixty days after June 30th, of each fiscal year hereafter, and upon the printed blank forms herein referred to, a supplementary inventory, and statement, marked "Additions," showing in the detail prescribed, the amount, and actual cost, of all additions and betterments which were made to road and equipment, during each fiscal year. . . .

Also each of said companies shall, at the same time, and for the same period, file a similar inventory, and statement, upon said printed blank forms, marked "Deductions," which shall show in detail the amount, and "value" of all property which has been replaced, or abandoned, during each fiscal year. The "value" given, shall be such "reproduction value," as was assigned to said property, and approved by the Commission, in the general inventory and appraisal of the property of said companies, which will be filed in pursuance of this order.

282— COMMISSION REPORTS—OKLAHOMA

The Fourth Annual Report of the Corporation Commission of Oklahoma, for the year ending June 30, 1911. 822 pages.

The following is a summary of the orders of interest for electric companies:

222—Accounts 133
Rules and Regulations for Uniform Accounts. Rule No. 6, page 143, describes the classification of Revenue and Expense Accounts for Electric Companies.

224—Schedules 230
All rates to be on file with the Commission.

74—Safety of Service 238
Specifications for pole-line construction.

129—Default in Public Service—Discrimination 354
A gas company supplied one hundred gas stoves free, as an advertisement, and refused to give a second stove to one applicant. Bordered on discrimination, and putting itself in position to supply free gas stoves to all its customers.

619—Rate Differentials—Effect of Gas Competition 479
An electric company raised its price of gas, for lighting purposes only, from 25 cents to $1.00 per thousand, to protect its electric business. Commission ruled that all gas must be sold at 25 cents, without regard to its effect on the electric business.

COURT DECISIONS

27—Appeal from Commission's Order.

Suit by Thompson v. Railroad Commission of Louisiana et al., to have orders declared null and void. Decision of Federal District Court of Louisiana, July 27, 1912, sustaining Commission's orders. 198 Federal Reporter, 691.

History of Case—Company had granted special rates on gravel shipments to Thompson, which Commission ordered abandoned.

> The Railroad Commission of Louisiana has the authority, and it is its duty to establish, reasonable and just rates of transportation, within the confines of the state. In doing so, they may adopt a mileage, or any other recognized, form of schedule; they may order the carrier to desist from giving special privileges; and they may raise, or lower, existing rates, as may be necessary, provided the rates adopted are reasonable and just. When they had made adequate inquiry, affording all parties in interest a chance to be heard, as was done in

this case, there is a presumption that the rates established by them are just and reasonable. It is immaterial how the inquiry is initiated, or what motive actuates the Commission, so long as they have jurisdiction, and do not exceed their authority.

Texas & Pacific Ry. Co. v. Railroad Commission.....
.....192 Fed. 280, 112 C. C. A. 538

Southern Pacific Co. v. Interstate Commerce Commission...
.....219 U. S. 498, 31 Sup. Ct. 279, 55 L. Ed. 310

33— CAPITALIZATION OF REPLACEMENTS

Extracts from Accounting Rules, Court Decisions, and the Writings of Authorities, in relation to the Capitalization of Replacements, compiled by Robert H. Whitten, Librarian-Statistician, Public Service Commission (1st District New York).

This is an excellent and valuable summary of the rulings and opinions on this subject.

The following is an index of the quotations:

In the Uniform Systems of Accounts, prescribed by various commissions, rulings against Capitalization of Replacements, may be found as follows:

New York (1st District).....Paragraphs 14, 20, 22, 24
(Under heading "Fixed Capital.")

Maryland.....June 12, 1911, paragraph 10
(Under heading "Fixed Capital.")

Wisconsin.....1909, page 81
(Under heading "Depreciation.")

Interstate Commerce Commission,

In General Instructions.....July 1, 1910, pages 13-15
(Under heading "Expenditures for Additions and Betterments.")

In Text of the Classification.....Paragraph A, 33

In "Uniform System of Accounts for Gas and Electric Corporations in the District of Columbia".....1909, page 57
(Under heading "Fixed Capital.")

The Accounting Rules of Associations contain rulings to the same effect.

Bell Telephone System, 1910, Standard Telephone Accounts, Accounting Circular, No. 6, issued by the American Telephone and Telegraph Company.

(Under headings "Reserve for Depreciation of Plant," and "Reserve for Depreciation of Tools and Vehicles.")

National Electric Light Association, 1908.....pages 14, 44, 45.
(Under headings "Amortization of Supersession," and "Operating Accounts.")

Court Decisions give like verdicts on this point.

United States Supreme Court,
Knoxville v. Knoxville Water Company.....Jan. 4, 1909, page 13

New York Court of Appeals,
Binghamton Light, Heat and Power Co.....203 N. Y. 7, 25

Commission Decisions follow the same line.

New York.

Case No. 1109, Coney Island and Brooklyn Railroad Company.
Decided Oct. 22, 1909.
Case No. 1181, Third Avenue Railroad Company.
Decided July 29, 1910.
Niagara Light, Heat and Power Company.
Decided June 29, 1909.

Massachusetts.

Boston Electric Light Co.....Mass. G. & E. R., 1895, 42
Chelsea Gas Light Co.....Mass. G. & E. R., 1903, 67

Testimony of Individual Authorities supports the view that property must be kept intact from earnings.

Timothy S. Williams, in a paper read before the Street Railway Accountants' Association of America, at its convention in New York City, October 9, 1911, gave a number of recent instances in which overcapitalization, and the charging of operating expense to capital account, had led to financial disaster to the railroads and street railways concerned. He recommended that the State Railroad Commission be given increased power to pass upon additional to construction accounts.

Walter A. Staub, C. P. A., article on "Deferred Charges to Operating," Journal of Accounting, October, 1909.
Henry Rand Hatfield, Associate Professor of Accounting, University of California,, treatise on "Modern Accounting," New York, 1909, pages 73, 74.

William B. Jackson, A Discussion of the Depreciation Problem with Particular Reference to Electric Railways, Engineering-Contracting, Feb. 8, 1911, page 177.

Francis W. Pixley, "Duties of Auditors," London, 1910, pages 422, 493, 495.
Robert H. Montgomery, C. P. A., in his American Edition of Dicksie's "Auditing," page 132.
Lawrence R. Dicksie, treatise on "Advanced Accounting," London, 1911, page 4.
P. D. Leake, treatise on "Depreciation and Wasting Assets," London, 1912, page 99.

2— NEW PUBLIC SERVICE LAW—OREGON

The Referendum on the Public Utility Act, resulted in approval of the measure by nearly a two-thirds vote. This law, 1911, C. 279, is modeled almost directly after the Wisconsin Law, but does not provide for indeterminate permits, and, like Washington, excludes from its jurisdiction plants operated by municipalities.

CURRENT REFERENCES

2—Public Service Regulation.

Legislation Versus Control by Regulation, a paper by J. E. Macdonald, read before the meeting of the Los Angeles Section of the American Institute of Electrical Engineers, Electrical World, Nov. 16, 1912, p. 1032.

The author states that practically all the good results obtained, in clearing the sky line of an over supply of poles, are about to be nullified by the action of the state legislature, in passing a law requiring an absurd method of pole construction. It was pointed out that there is urgent need of placing the control of overhead construction in the hands of the railroad commission, a body of engineers which controls practically every move made by public utility companies in California, except that of overhead construction.

2—Public Service Regulation—Maryland.

Brief by Vernon Cook, W. Calvin Chesnut and Charles Markell, Counsel, representing the Consolidated Gas, Electric Light and Power Company of Baltimore, in the complaint as to the reasonableness of gas and electric rates, 402 pages.

The Company opposes enforced reduction and says:

> The surest way to make possible future reductions is to preserve and increase the credit of the Company. * * * The full investigation of this case has demonstrated the reasonableness of existing rates * * * but the company is willing to confer with the commission on the details of a sliding scale for the future automatic adjustment of charges for gas and electricity and dividends to be paid.

Brief of Albert W. Ritchie, Peoples' Advocate, representing the complainants, 329 pages.

Mr. Ritchie argues for an immediate reduction of the gas rate to 70c per thousand feet, and a maximum electricity rate of 7c per kilowatt hour.

6—Rate Practice.

Rate Systems from the Central Station Solicitor's Viewpoint, by J. E. Bullard, Electrical World, 2½ pages, Nov. 16, 1912, p. 1042.

Discusses the psychological effect of different types of rate schedules on the consumer, and gives curves and tables illustrating the points dealt with.

31—Valuation.

Order of California Commission Requiring Valuations of Electric Railways, editorial and article, Electric Railway Journal, Nov. 16, 1912, pp. 1015, 1027.

Comments on the order of California Commission given on page 118 RATE RESEARCH.

31—Valuation.

Rate Fixing and Appraisal, by Professor C. L. Cory, Journal of Electricity, Power and Gas, $2\frac{3}{4}$ pages, Nov. 9, 1912, p. 407.

Discusses the elements to be taken into account in fixing rates of return, and value, which must include, in addition to the physical property, going value, with due allowance for development expense, and the difference between a fair return and the actual return, during the development period.

33—Capitalization.

Is It Economic to Issue Bonds for Public Improvements if the Life of the Improvement Is Less Than the Life of the Bond? Engineering and Contracting, Nov. 13, 1912, page 533.

In brief the principle may be stated, that if considerably more can be earned by the use of borrowed money, than it costs the borrower, it is economically sound and profitable to borrow. Rockefeller called attention to this, in saying that one of the chief reasons for his success, was his ability to borrow money. While the investment for improvement yields increased income, and so long as the value for the improved property is kept intact out of earnings, or in case of public highways, etc., out of taxes, it matters not whether the life of the improvement, whose original cost was paid by the bond, is long or short.

33—Capitalization—Rehabilitation.

Application of the Riverside Traction Company, Trenton (pop. 96,815), for authority for a bond issue. Decision of New Jersey Board of Public Utility Commissioners, denying the application. Electric Railway Journal, Nov. 9, 1912, page 1007.

The chief inspector for the Board investigated the company's property and accounts, and reported that a certain part of some improvements which had been capitalized in the past two years, should more properly have come out of income, and therefore "an ample amount of securities had already been issued to cover all charges properly chargeable to capital account."

34—Rate of Return.

The Element of Risk, an editorial, Journal of Electricity, Power and Gas, Nov. 9, 1912, page 418.

States that in the highest evolution of regulation, in which the return on invested money is kept at a minimum, there should be some guarantee, in addition to the ordinary sinking funds for depreciation and obsolescence, for the investor against the total loss occasioned by new inventions superseding and rendering obsolete the tangible equipment of the investment.

51—Cost of Service Theory.

Cost of Power in Central Stations, by Henry D. Jackson, Power, 3 pages, Nov. 12, 1912, page 700.

The paper gives figures from two specific cases to show the initial cost of kilowatt, and the cost of producing a kilowatt-hour.

Presents the "isolated plant" arguments relative to Central Station costs.

62—Character of Service.

Electricity in Stove Manufacturing, an illustrated article, Electrical Review, 6 pages, Nov. 16, 1912, page 919.

Gives figures on comparative operating costs of stove-manufacturing plants, to show that a considerable saving can be effected by purchasing power. If steam operation is employed, the many advantages of motor drive are equally as important as the actual saving in power costs, that can be shown. Data on several plants are given.

84—**Municipal Operation.**

The Present Status of Standard Forms for Reporting Statistics of Municipal Public Utilities. Engineering and Contracting, Nov. 13, 1912, page 534.

The American Society for Municipal Improvements has not been able to secure the adoption, by municipal superintendents, of a standard form for reporting water works statistics. The secretary says, "there are in this country, at least 500 of these which have at hand, data sufficient to answer a considerable proportion of the questions contained in the form herein discussed. The difficulty lies in persuading them to do so; in demonstrating to each one the advantage of it, and then in overcoming his disinclination to exert a little effort, in performing work which he is not compelled to do."

91—**Promotion and Growth of the Business.**

The Progressive Spirit, address to Electrical League of Southern California, by S. M. Kennedy, Journal of Electricity, Power and Gas, 2 pages, Nov. 9, 1912, page 423.

States that the progressive spirit should be cultivated by all connected with the electric industry, and quotes Mr. Thomas A. Edison, who considers that the chances of big new electrical inventions "are much greater than before the telegraph, the telephone, the electric light and the electric motor were invented," and that "we have just started on our electrical way."

99—**Employes.**

The Telephone Pension Plan, editorial and news item, Electrical World, Nov. 16, 1912, pp. 1023, 1028.

The American Telephone and Telegraph Company has set aside a ten million dollar relief fund, to provide for employes of the Bell system in their old age or disablement. A good example of a voluntary measure of financial and social justice on a great scale.

313—**Prices.**

Economics of Power Transmission Lines, by Alfred Still, The Canadian Engineer, 5 pages, October 24, 1912, page 652.

The paper deals with the economics of the overhead power transmission line, from a broad, practical standpoint, gives comparisons between the relative advantages and costs of various alternatives in construction, and tables of estimated costs of materials, and depreciation.

453—**Load Factor.**

Load Curves of a Public Garage, Electrical World, Nov. 16, 1912, page 1046.

Curves, with notes, showing daily and monthly demand characteristics, of a prosperous Chicago garage stabling seventy-five electric pleasure vehicles.

453—**Load Factor.**

How to Increase the Power Load of Small Central Station Companies, a paper by D. Davis, read before the Convention of the Illinois State Electric Association, Electrical Review, 2 pages, Nov. 16, 1912, page 925.

Gives practical suggestions from a successful experience in securing a fair motor load for a small central-station.

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RATE RESEARCH

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120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

Vol. 2. CHICAGO, NOVEMBER 27, 1912 No. 9

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

NEW RATES

619—Rate Differentials—Discounts

THE CANTON ELECTRIC CO. [OHIO] (Pop. 50,217), has issued a supplement to its lighting schedule, changing the form of its discounts.

The Company says:

> The schedules in effect when the Public Utility law was passed, provided that all discounts, whether for quantity or long hours use, were allowed only if paid within ten days. Before the adoption of the Act, there was some elasticity in applying this rule, particularly where the bills were large, and the discount also large. After the passage of the Act, the company gave all hands a first notice, then rigidly enforced the discount provisions.
>
> A customer had a gross bill of $9.80 which would have been discounted at 50 per cent, had he paid within the discount period. He appealed to the Commission, and they notified the company to separate its discounts into prompt payment discounts, and such discounts as should be allowed for long hours burning. This was done, as per the following supplement:

Rate—10 cents per kilowatt-hour

Discounts—General

Over $2.00 and over 2 hours daily average use, 10%.
Over 3.00 and over 3 hours daily average use, 20%.
Over 4.00 and over 4 hours daily average use, 30%.
Over 5.00 and over 5 hours daily average use, 40%.

Prompt Payment Discount

> In addition to the discounts above set forth, an additional discount of 10% will be allowed on all bills, which, minus the discount, amount to more than $1.00, provided payment is made within ten days from date of bill.

122— JUST AND REASONABLE CHARGES

BASIS OF RATE MAKING (RATE REASONABLENESS), a 43 page pamphlet, issued by the DEPARTMENT OF REGULATION, OF THE NATIONAL CIVIC FEDERATION, is the third to appear of the fifteen parts of its compilation and analysis of public utility regulation laws of the United States.

EDITORIAL NOTE.—All indented matter is direct quotation.

In this number is given, a condensation of the provisions relating to rates, in the public utility laws, arranged under the headings:

A—General requirements as to reasonableness of rates.

B—Elements to be considered as a basis for reasonable rates.

C—Valuation of the property of utilities.

D—Sliding scale, profit sharing, automatic adjustment, minimum charge, and graduated charges.

Under the first, reasonableness of rates, the typical expression is:

> That all charges made, demanded or received by any public service corporation, or by any two or more public service corporations, for any product or commodity furnished, or to be furnished, or any service rendered, or to be rendered, shall be just and reasonable. Every unjust or unreasonable charge made, demanded or received, for such product, or commodity, or service, is prohibited and declared unlawful.
>
> California, Stats, 1911, ch. 14, secs. 13(a).

Under the second heading, basis for reasonable rates, the provisions cited follow the principle of the cost of service, allowing the commission to examine all pertinent facts, specifying variously the character and nature of the service performed, entire earnings of the company, expenses, income, reasonable value of all property, and reasonable return upon the investment.

Michigan mentions in some detail, items to be taken into account in fixing price for electricity,

> including cost, reasonable return on actual value of all property used in the service, depreciation, obsolescence, risks of business, value of service to the consumer, the connected load, the hours of the day when used, and the quantity used each month. Pub. Acts, 1909, No. 106, Sec. 7.

This is the only law which names "value of service to the consumer" as an element which may be considered in fixing a rate.

New York provides that the

> commission may consider all facts which in its judgment have any bearing upon a proper determination of the question * * * with due regard, among other things, to a reasonable average return upon capital actually expended, and to the necessity of making reservations, out of income, for surplus and contingencies. Laws, 1910, ch. 480, Sec. 72.

Under the third heading, are given the provisions pertaining to valuations, authorizing the making of appraisals, the employing of experts and inspectors for this work, requiring public utilities to make full reports to the commissions, and giving access to the books, records,

and accounts, contracts, vouchers, receipts and all other papers or documents of companies which may be deemed necessary for the purpose of valuation.

Under the fourth heading, are given the sections of the public service laws of seven states, approving the adoption by public utilities of sliding scales, profit sharing, automatic adjustment, minimum charge and graduated charges, as encouraging economies, efficiencies and improvements, and ensuring an equitable distribution of the benefits and advantages arising from them.

On page 43 is given an alphabetic list of references to the sources of the compilation.

(Ed. Note.) If permission can be obtained a full summary of the above abstract of laws relating to electric companies will be printed in the next issue of Rate Research.

COMMISSION DECISIONS—WISCONSIN

223—Rate Regulation

Complaint of Commercial Club of Superior v. The Superior Water, Light and Power Company (Superior, pop. 40,384), alleging rates for water, electricity and gas are discriminatory, unreasonable and excessive. Decision of Wisconsin Railroad Commission, continuing water and gas rates, and reducing electric rates.

Snperior is the second largest city in Wisconsin, and for this reason this is the most important complete rate decision of the Commission.

Important paragraphs from the opinion are as follows:

31—Valuation

Complainant contends that the amount upon which a rate of return should be allowed is properly limited to the present value of the physical property. The respondent company points out that such a value ignores the existence of intangible elements, which, in the present case, it is contended, reach substantial proportions. Stress is also laid upon the investment, or cost to the owners, as an element of value. The evidence submitted upon the various factors usually included in valuations for rate making purposes, has been through, and is not a matter of extended controversy in the present case. The question of valuation has therefore resolved itself into an examination of principles rather than a further sifting and discussion of facts.

319—Land

It appears that the real estate owned by the respondent company was purchased during a boom period; and that as a result, considerable depreciation is noted, when the investment value is com-

pared with the value as found by the appraising engineer. It is contended that no more property was purchased than was actually necessary at the time, nor greater amounts paid than the prevailing market prices, and that since these items were a legitimate and necessary expenditure, they should be taken into consideration in determining the basis upon which the rate of return is properly computed. This Commission has had occasion in former cases to pass upon the question of appreciation of land values. It was held in the Madison case:

"That the law, as well as our social system, recognizes such gains in practically all other undertakings, is evident from the fact that rents, and interest charges, usually vary with the natural increase in the value of the property they cover. As the cost of reproduction of a plant, usually plays the most important part in determining its value, it is more than likely that the owners would have to bear losses, in case land and other property had depreciated instead of appreciated. It would seem only just that the rule would work both ways. In view of these facts there would seem to be good ground from both a legal and economic viewpoint, for giving such appreciations in value consideration in appraising public utilities. At any rate, we can not now see good reasons upon which to exclude these elements from the appraisal of utility properties.

State Journal Printing Co. v. Madison G. & Elec. Co. . . .
. . . . . 4 W R C R 501-579"

There seems no reason why a departure should be made from this rule in the present case.

314—Overhead Charges

Reorganization Expense—This item is relatively small and needs no extended discussion. Expenditures of this character are a necessary and legitimate part of the cost of the business and have for this reason, received consideration in Milwaukee for rate making purposes.
City of Milwaukee v. T. M. E. R. & L. Co.. . . 11 W R C R 1, 156.

Discount on Bonds.—The respondent maintains that all discounts on the 5% bonds, which were largely to offset the risk incurred by investors, should be included in the valuation of the property of the company, but concedes that discounts on the 4 per cent bonds should be excluded. It is pointed out that the allowance for bond discounts as a legitimate part of the valuation for rate making purposes, must be determined, not on the basis of present conditions, but with regard to the capital hazard involved at the time of issue.

In investigating these bond discounts the question to be determined is whether the capital necessary for the construction of the plants at that time, could not have been secured upon any better terms.

It appears that by 1889 Superior was "intoxicated with another boom," and that the financial storm that swept the country in 1893, was severely felt in Superior, and was succeeded by a period of slow recovery. It is noted that before the panic, the bonds sold by the respondent were disposed of at a fairly large discount. It is claimed that the first bonds, sold during the height of the boom, might have been sold to local investors at a higher rate than 80. It does not seem probable, however, that a higher price could have been secured from outside investors, in a practically untried enterprise, with very little earning power. It is difficult to see on what grounds a part at least of the bond discounts made should not be included in the cost of the plant. In the case before us, of the total discounts on the 6 per cent bonds, $188,000 was charged by the company to plant, and $14,250 to profit and loss. Of the amount discounted on the 4 per cent bonds, $25,250 was charged to plant, and $71,445 to profit and loss. If business enterprises cannot secure capital on any better terms, then it necessarily follows, that such bond discounts must represent a part of the cost of securing the capital.

"This does not mean that all discounts constitute proper additions to physical value. If this were the case, a company with poor credit, which had been obliged to allow a large discount on its bonds, would have a higher value, and be entitled to a return on a greater valuation, than a utility owning precisely similar property, but whose credit was good enough so that it was not obliged to issue its bonds at a considerable discount."

City of Marinette v. City W. Co..... 8 W R C R 334, 343

315—Intangibles

The matter of going value, or the cost of the plants and their business, has been extensively considered in previous decisions, and further elaborate discussion of the principles therein announced, would only result in unnecessary repetition. Briefly stated, it has been held that the cost of building up the business must, under certain conditions, be taken into consideration, in determining the value of the plants for rate fixing purposes.

Hill v. Antigo Water Co..... 3 W R C R 623, 711
State Journal Printing Co. v. Madison G. & Elec. Co..... 4 W R C R 501, 568
City of Milwaukee v. T. M. E. R. & L. Co.....11 W R C R 1, 122

The early losses or deficits, or the amounts by which the earnings of the plant have failed to meet the ordinary operating expenses, taxes, depreciation and a reasonable return on the investment, will measure, in the majority of cases very closely, the cost of developing the business. Deficits from operation, however, cannot equitably be taken into account in the appraisals of plants, regardless of the conditions under which they were incurred. Deficits due to abnormal conditions, bad management, poor judgment, extravagance, lack of ordinary care and foresight, and extremely high capital charges, etc., it is clear should receive very little consideration.

"Going value, must of course, be applied to plants that have been constructed and operated under normal conditions and when ordinary business capacity has been exercised."

City of Appleton v. Appleton W. W. Co..... 5 W R C R 215, 276
Cunningham v. Chippewa Falls W. W. & Lt. Co 5 W R C R 302, 314

To consider such costs in determining the cost-value of the property of public utilities that is actually used in serving the public is of special importance in cases where the returns on such cost-values are not fixed at higher figures than those which will barely bring the necessary capital and business ability into this field.

511-512—Apportionment of Investment and Expense

No suggestion is made by either respondent or complainant, as to possible readjustment in the joint operating expenses applicable to the water, gas and electric departments. An examination of the detailed income accounts for the three years ending June 30, 1909, 1910 and 1911, Tables 2, 3 and 4, discloses the necessity of certain corrections in the distribution of the General and Undistributed expenses. The Commission's analysis discloses total direct expenses, in the three departments, of about 23% of the total in the water department, 30% in the gas, and about 47% in the electric department.

According to company's practice, the general and undistributed expenses have been distributed about 31% to 35% to the water plant, about 24% to the gas department and about 43% to the electric plant. This method has brought about an increased cost in the water department operating statement, and a reduction in the gas and electric operating statements. In the corrected apportionments made by the commission this shifting of the burden of the overhead expenses has been remedied.

32—Depreciation

Reduced to percentages of the Commission's cost of reproduction new, it is noted that for the year ending June 30, 1911, company has set aside 6.75% to cover depreciation in the electric department, 2.382% to cover depreciation in the gas department, and 1.1257% to cover depreciation in the water department. For the year ending June 30, 1912, these reserves aggregated 5.847% for the water department. A computation of the average life of various groups of depreciable property would indicate that these allowances are in excess of what would be reasonably required each year to offset depreciation, and accordingly the allowances made in determining the cost of service have been placed at 4.5% of the total cost of reproduction new, in the electric department, 2% of the total cost of reproduction new in the gas department, and .8% of the total cost of reproduction new in the water department.

34—Rate of Return.

Complaint alleges that the rate of income that the company is entitled to earn is properly restricted to 6%, and computes this return upon the present value of the property of the respondent. In arguing for a 6% return, it is claimed that conditions making for security of investment are especially favorable in Superior. Reference is made to the rates of interest paid on borrowed money, by municipality, and by certain large industrial concerns in the city. Attention is likewise called to various cases where a return as low as 5% upon the investment has been sustained as reasonable by a court of review. Especial emphasis is placed upon the fact that Duluth and Superior obtain their supplies of water, light, and power, from the same source, and that the Superior rates are in excess of those obtaining in Duluth, which fact it is claimed should sustain a low rate of return. It is urged, moreover, that since the company purchases its gas and electric service, much of the hazard obtaining in gas and electric enterprises in other cities, has been eliminated. The respondent company cites in rebuttal various recent authorities upon the rate of return, and especially calls attention to court decisions, wherein rates of return as high as 10% have been allowed by the courts. Attention is called to the fact, that the rates passed upon by courts are, in many instances, the minimum reasonable rates, and that in the rates fixed by a commission, these may reach higher figures.

Respondents contend that the valuation of the property and rate of return upon such a property are complementary and that the amount allowed as a reasonable return upon the investment must be determined after consideration of past risks already contained in the total of the property. It is contended that the rate of return should be fixed to cover—(1) A rate of interest made up of pure interest, plus additions due to narrow market, and lack of established value for purposes of sale or hypothecation, plus an addition for lack of an established earning power. (2) A rate to cover inherent risks of the business. (3) A rate to cover risks due to short term and non-exclusive franchises. (4) A rate to cover community hazards. Where the valuation is restricted to the mere cost of reproducing the physical property, service value or the lowest measure of economic value of the plant to the community, it is stated that the return upon the investment should be taken at 10% for the water plant, 11% for the gas plant, and 17% for the electric plant. If bond discounts on 6% securities are included in the capital value and organization expenses are added, thus eliminating in part the element of narrow market and the lack of established earning power the proper rates are estimated at $8\frac{3}{4}\%$ for water, $9\frac{1}{2}\%$ for gas, and 15% for the electric plant. If a further addition is made to cover discarded apparatus, shrinkage in the value of portions of the existing property, etc., thus eliminating the hazards due to the state of the art, changed conditions, etc., these rates of return may be further reduced to $8\frac{1}{4}\%$ on the water

plant, 9¼% on the gas, and 11% on the electric plant. If in addition to this there is added to the value that sum by which net earnings have fallen short of covering depreciation and a 7% return upon the water department, a 7½% return upon the gas department, and an 8% return upon the electric department, these amounts covering compensation for the losses sustained in the past due to building up the business, then it is contended that the fair rate of return may be reduced, to 7% on the water department, 7½% on the gas department and 8% on the electric department.

Interest and profits are necessary in all lines of industry and callings in order to secure the capital and the abilities that are required. Necessary charges of this nature are therefore, in a sense, as much a part of the cost of reproduction of the products turned out and of the services rendered as any part of the operating expenses. All this is quite generally admitted. Such differences of opinion upon these points as are frequently arising in cases before us are concerned with what are the rates or amounts that should be allowed for such charges, rather than with the necessity of providing for such charges at all.

The minimum rates of interest and profits that must be allowed in cases of this kind are those under which the necessary capital, and business capacity can be had. If less than this is allowed, then these factors will be withheld not only from original undertakings, but from extensions or additions to existing plants. Such a course would deprive the public of needed service, and would clearly be contrary to public policy.

But even where active competition is minimized, public utilities are not free from risks. Individual users are often providing their business houses and factories with light, power, and even water, through their own plants. New inventions and discoveries are constantly changing present conditions, and such changes, even when profitable in the end, often result in serious temporary losses. During the past twenty years, for instance, gas has been almost driven out of the illuminating field by electricity. Unexpected stagnations, and radical changes, in the growth of cities, often lead to considerable losses, and this may also be the effect of far reaching ordinances, and other legislative requirements. The marked tendencies of indeterminate, or more exclusive franchises, to reduce capital charges, is not as yet felt to its full extent in this state, because of the uncertainties, in the minds of investors, as to whether the policy granting such franchises will be permanently adhered to.

The questions as to what constitutes reasonable returns for interest and profits, are raised before this commission in practically every rate case, as well as in all cases where we are asked to authorize security issues for new plants and for extensions and additions to existing plants. Every phase of the issues involved in these questions is constantly under investigation by us. In these investigations, the actual and relative importance of the various factors

which effect the charges in question, are presented and argued. The minimum rates at which capital can be had, both on securities which cover a part of the cost value of the property, and on securities which cover the entire cost value of the property has again and again had to be more definitely determined by us. It is by facts obtained in this way that the commission is largely guided in its conclusions.

It is perhaps only fair to say that our conclusions in these respects are not satisfactory to all. Complaints often say that the amounts we allow for interest and profits and for discounts on bonds are higher than they deem proper. The ultilities on the other hand, in almost every case, hold that our allowances for these purposes, are too low. When the facts upon these points are summed up, however, it will be found that our allowances for capital charges are no higher than those which have been shown to be necessary to obtain needed service that is adequate and continuous. In fact, many instances are met with where because of the limited business of the plants the allowances for the time being at least, are lower than this.

132—Protection from Competition.

Without an investigation into the Duluth Edison Electric Company's accounts, and operating statistics, it is impossible to say definitely what is the cause of the low rates in effect there. From a superficial examination, it would appear that this company has cut their prices to the lowest possible figure, in order to combat the idea, prevalent in Duluth, of the desirability of a Municipal Lighting plant. It appears to be the Company's aim, that, rather than see a Municipal plant, with demoralizing competition (for the company claims that it cannot be driven out, sold out, or confiscated), it would cut its rates to a point where only enormous sales would bring it any profits.

It is realized that there is great danger in generalizing from insufficient data, in an investigation of this sort, but without more details relating to the operating and financial statistics of the Duluth plant, only general deductions can be made.

The Duluth-Edison Electric Co. maintains that it is only by selling current for power, or for operating household appliances, in daylight hours when the current is not needed for lighting, at an extremely low rate for this service, and thus building up a larger use of electrical household appliances than in any other city of Duluth's size, that they have been enabled to maintain their present low lighting rate. They claim that at the present rate of 8 cts. per kw. hr., they are serving several hundred "short hour" consumers at a loss, which is only made up by the volume of revenue from all other customers.

It appears from the investigation made into the Duluth situation, that in as far as the Water and Light departments are concerned, in the last fifteen years, nearly three times as many bonds have been issued for these departments as for general purposes, and that the plants are showing a surplus of income, over operating expenses, in their reports only due to the fact that no charge is made in the rates to cover interest, depreciation and taxes, with the exception of interest on the bonds. With a proper charge for these items included in the rates, the rates will, it seems probable, be as high, if not higher, than the proposed rates in Superior.

As regards the electric situation, the universal and fundamental laws of nature, self-preservation, is pushing the Duluth-Edison Co. to meet any rate which is feasible and which allows them some profit on large sales, in order that the agitation for the establishment of a municipal electric plant will subside. They do not want a competing plant, and it is a fact that wherever two competing electric plants have been built the people usually have to pay for both. The Duluth Co. says in one of its advertisements "this company can hold its own against any competition a municipal plant can possibly bring." In order not to have this additional plant established it appears that they are voluntarily reducing their rates right along as their business increases.

69—Rate Schedule

General Lighting Rate—Includes energy furnished for lamps and other appliances for illumination purposes, and motors of 1 H. P. rated capacity or less.

Rate

11 cents per kilowatt-hour for first 40 hours use per month of active connected load.
8½ cents per kilowatt-hour for next 60 hours use per month of active connected load.
6 cents per kilowatt-hour for excess use.

Special Rates

7 cents per kilowatt-hour for signs, and outside decorative lighting, on a yearly contract basis.
8 cents per kilowatt-hour for window, show case and basement sales room.
6 cents per kilowatt-hour for heating and cooking.

Determination of Demand

Active connected load shall, in every case, be a fixed percentage of connected load, consisting of lamps, appliances, etc., installed upon consumer's premises.

Class A. Residences, dwellings, etc., 60% shall be deemed active, when connected load is 500 watts or less. Over 500 watts, 33⅓% active.

Class B. Banks, offices, stores, etc., 70% shall be deemed active, when connected load is 2500 watts or less; 55% for excess over 2500; 20% shall be deemed active for storage space.

Class C. Federal, State and County buildings, churches, hotels, clubs, etc., 55% shall be deemed active.

Class D. Unmetered lighting for signs, outlines and windows, contracted for on a yearly basis, 100% shall be deemed active.

Minimum Charge

5 cents net per month per 50 watt unit.
35 cents net per month per 100 watt, for signs, etc.
$1.00 net per kilowatt installed, for heating and cooking.
30 cents per 100 watts, for window, show case, etc.

Prompt Payment Discount

1 cent per kilowatt-hour.
The power and municipal lighting rates are not disturbed.

COMMISSION DECISIONS—WISCONSIN

69—Rate Schedule—Eau Claire.

Decision of the Wisconsin Railroad Commission, in the matter of the rules, regulations and practices of the Chippewa Valley Railway, Light and Power Company of Eau Claire (pop. 18,310), Electrical World, Nov. 23, 1912. p. 1086.

The company is ordered to establish the following rate.

Demand charge, 15 cents per month per active lamp of 50-watt capacity.

Energy charge, 3 cents per kw. hr.

For window or sign lighting, one-third of the demand charge is levied.

Determination of Demand.

Class A—Residences, etc., 60% of the connected load up to 500 watts, and 33.3 per cent of the excess, shall be considered active.

Class B—Stores, banks, etc., 70% active.

Class C—Hotels, federal, state, and county buildings, schools, small factories, etc., 55% active.

Class D—Opera houses, churches, etc., 40% active.

Class E—Signs, 100% active.

A second optional schedule determines demand by dividing rooms into active and non-active.

81— MUNICIPAL REGULATION

Answer of The Chicago Telephone Company to the Report of Edward W. Bemis, Submitted to the Committee on Gas, Oil and Electric Light, of the City of Chicago, November 21, 1912, 31 pages.

An abstract of Professor Bemis' report was given in 2 R R 85-89.

The five items disallowed, in whole or part, by Professor Bemis are, working capital, paving, overhead charges, cost of developing the plant, and cost of developing the business.

The Company says in its answer:

> It is a matter for congratulation, both from the standpoint of the company and of the city, that, with the exception of five items, the valuation of the engineers is accepted by both Professor Bemis and the company.

32—Depreciation

> These assumptions [resulting in estimated surplus of $700,000], relate largely to the matter of depreciation, where the interests of the public and of the company are identical. The interest of the company in preserving its investment as nearly unimpaired as may be, is no more direct than is the interest of the public in this same factor, from the standpoint of adequate facilities, and unimpaired efficient service.
>
> A sufficient depreciation allowance is as essential to unimpaired service, as it is to unimpaired investment. We believe that when the radical and manifest errors and omissions of the report of Professor Bemis are corrected, its effect is simply to corroborate the conclusions of his predecessors, and to sustain the contention of the company that the present rates are unreasonably low, and that any revision of them should not be downward but upward.

At the hearing before the Committee, N. T. Guernsey, the recently appointed special counsel to the American Telephone and Telegraph Company, stated the position of the company.

CURRENT REFERENCES

1—Public Service.

Not a Public Utility, Electrical Review, Nov. 23, 1912, page 985.

The Supreme Court of Wisconsin held, in the case of Cawker vs. Meyer, that a building owner does not come within the meaning of a statute constituting every one a public utility who shall furnish heat, light or power to the public, by furnishing heat, light and power to his own tenant and selling the surplus to three neighbors.

2—Public Service Regulation.

Are Public Service Commissions Worth While, editorial, Electrical Review, Nov. 23, 1912, page 962.

A study of the work of the public service commissions shows that the advantage, both to investors in, and customers of, utility companies, far outweigh the expense to the tax payers, for the maintenance of such commissions.

Some of the advantages to the utilities are, protection from competition, from the expense of maintaining a lobby at the state capital to influence legislation, and similar expenditures to municipal councils, the greater security of investments, and oftentimes greatly increased business from reduced rates.

254—Experts.

Concerning Expert Testimony by Engineers, Engineering News, 1½ pages, Nov. 21, 1912, page 974.

This is a summary of a very interesting discussion at the last meeting of the American Institute of Consulting Engineers, on expert testimony and needed reforms therein. The appointing of experts by the Courts, as in Germany, was advocated, and also the plan of the New York Chamber of Commerce securing arbitration, was favorably reported upon.

31—Valuation.

Report of the Committee on Railroad Taxes, and Plans for Ascertaining Fair Valuation of Railroad Property, of the National Association or Railway Commissioners, article and editorial, Electric Railway Journal, 2½ pages, November 23, 1912, pages 1051, 1062, 1065.

The report states that at the present time great confusion exists, in the methods pursued by the different states, in making valuations, and the difference in results obtained, caused by slight variations in methods, is remarkable. The standardization of forms for valuation purposes, the compilation of tables of current unit prices, and of arguments for the different methods of valuation, and the framing of a set of rules regarding them, are recommended as means for attaining greater uniformity, and consequent justice and fairness of valuations.

611—Flat Rates.

Flat Rates for Tungsten Signs, editorial, and abstract of a paper, by George E. Fuller, read before the convention of the Illinois State Electric Association, Electrical Review, 2½ pages, Nov. 23, 1912, pages 963, 973.

Presents the advantages of flat rates for securing continuity, and extension, of the business of tungsten sign advertising.

Rates should be figured to include lamp renewals, on the basis of two complete installations per year, washing and painting of signs, and energy at a slightly higher rate than the previous meter rates.

62—Character of Service.

Electricity in Tanneries, illustrated article, Electrical Review, 6 pages, Nov. 23, 1912, page 967.

Gives data of operating results, showing that the diversity factor, in the operation of tanneries, offsets, to a large degree, the value that would exist in the use of exhaust steam for heating purposes, and this condition, together with the actual saving in energy required to do the work, makes central-station service very successful for this industry.

83—Municipal Ownership.

Leased Private Operation of a Municipal Plant, Electrical World, ½ page, Nov. 23, 1912, page 1099.

The municipal electric lighting system of Emporia, Kansas, which was leased by the Emanuel syndicate of Dayton, Ohio, in April, 1911, for twenty years, has, in eighteen months, under private operation, extended its distributing system by more than 100%, gives service to nearly twice as many customers, has developed many new industries, and built up a good day load.

92—Economy and Efficiency.

An Analysis of the Losses of a Hydro-Electric System by J. D. Ross, Southern Electrician, 4 pages, Nov. 1912, page 485.

Gives data showing losses at the various points in existing hydro-electric generating and distributing systems, with tables of efficiency for different units.

92—Economy and Efficiency.

The Management of Public Electric Supply Undertakings, by A. Hugh Seabrook, The Electrical Times, (London), Nov. 14, 1912, page 465.

This is the first in a series of lectures to be given at East London College. It deals wuth the matter of efficiency in the management of central stations, and advocates every possible improvement in service, on the ground that this method is a paying proposition, means increased profits and greater success, besides the satisfaction of knowing one is doing the right thing.

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RATE RESEARCH

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Rate Research

Vol. 2. CHICAGO, DECEMBER 4, 1912 No. 10

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATE RESEARCH COMMITTEE NEWS.

The Rate Research Committee, at its meeting held in Chicago on November 19th and 20th, 1912, decided upon a complete separation of the pages of RATE RESEARCH into the following divisions:

First. Committee News.

Second. Reference to the Theory and Practice of Electric Rates as distinct from the rate of return on the whole investment.

Third. References and Decisions of the Courts and Commissions, and Public Service Regulation, Rate of Return and allied subjects.

Such a separation begins in this number, but no change will be made in the general classification numbers as outlined in the first issue. Where articles cover more than one subject the abstract will be included in that part which predominates.

The Committee devoted much of its time at these meetings to an exhaustive study of the form and actual wording which should be used in rate schedules, for the basic rates and rate methods, now in general use. Beginning next week RATE RESEARCH will publish a series of typical rate sheets, giving the rates of certain companies expressed in the form recommended by the Committee.

Announcement was made at the meeting, that several of the Member Companies would, at an early date, print and publish schedules in accordance with the recommendations of the Rate Research Committee. This is especially gratifying to the Committee.

Correspondence is cordially invited from any companies who are, at the present time, revising their rates or schedules, with the object of co-operation in the development of a more satisfactory schedule.

EDITORIAL NOTE.—All indented matter is direct quotation.

ELECTRIC RATES.

LOAD FACTORS AND RATES.

453—Load Factors.

LOAD FACTORS AND RATES, a paper compiled by the Bureau of Statistics and Accounts, Public Service Commission for the First District, New York, ADNA F. WEBER, CHIEF STATISTICIAN. Volume IV, Annual Report, 1910, page 14. (Continued from 2 R. R. 106.)

Reserve.—Economy requires that producing units be of large capacity. Their tendency is to become larger and larger. This makes it impossible closely to adjust capacity to demand, except rarely and temporarily. Growth of demand is continuous; growth of productive capacity, intermittent or discontinuous. When an addition to a plant is necessary, it may be that even a rather small unit will provide for several years' future growth. How much of a reserve for future growth an addition should economically provide for beyond immediate need is a question for engineers and managers. The economic necessity of making additions in large units is of interest in the present connection because the maximum peak load, not the average demand, compels the addition. But, except so far as the necessity of additions may be avoided through keeping the peak down by carefully adjusted rates, the practice of providing additional capacity in excess of immediate need is due not so much to economic as to physical factors, e. g., the larger boiler consumes less coal per horse power produced. The definition of the standard load factor does well to avoid this phase of the problem of adjusting supply capacity to demand by dealing with the varying amounts actually produced and consumed, without regard to the presence of excess or reserve capacity.

Influence of Rates on Demand.—The business man is naturally not fatalistic about demand in relation to capacity. Demand can be stimulated where it is small. Total demand can be split up into the demands of different classes of consumers. "Divide and conquer" is the rule to apply. It will be found that not all classes of consumers or kinds of demand are equally burdensome as regards the fixed investment they require. Such as inflict less cost may well get the benefit of better rates. And the more burdensome sort of demand may be held down by a higher rate. Rates will be arranged so as to stimulate off-peak demand and depress the peak load. Numerical indices of the importance of load factors are needed in order to deal with this general situation.

Peak Load.—The terms "peak" and "peak load" have already been used in the sense assigned to them by engineers. This usage very likely originated, and at any rate can best be understood, with reference to the curves which are used to represent the variation of demand or output within a 24-hour or other period. The peak is the point or portion of the curves, or the demand and load which the point or portion represents, that mounts highest above the base line. But there may, of course, be one or more subsidiary peaks, surrounded by areas of less load.

Width of Demand.—Whether peak means point or portion is of more than graphic significance. If the company determines the location and amount of the peak by maximum registering apparatus, the load in question is momentary and the term "point" is appropriate.* But the obtainable figures may be those of a watt-meter read at regular and frequent intervals. Suppose this interval is 15 or 30 minutes or an hour, then the largest difference in kilowatt hours between two successive readings locates the peak for practi-

*To be qualified on account of the time-lag of a maximum register.

cal purposes. The reading actually gives the *average* demand during the interval of the maximum load. In order to get the maximum in terms of kilowatts a difference for a fifteen-minute period is to be multiplied by four, and similarly for any period less than one hour. There is, of course, no process of averaging involved, though this sort of "maximum" is an average. In comparisons it is important to deal with the same kind of peaks. But it is scarcely possible to adopt one sort to the exclusion of others. The facility with which the machines may carry a momentary overload impairs any claim the strict maximum peak might have to exclusive consideration. Hence the load factor is considered to be based upon a maximum carried during some specified brief interval. Convenience of comparison seems to favor the hour interval.

Definition.—The fundamental *load factor* is defined and commented upon by the Standardization Rules of the American Institute of Electrical Engineers, as follows: "The load factor of a machine, plant, or system is the ratio of the average power to the maximum power during a certain period of time. The average power is taken over a certain interval of time, such as a day or a year, and the maximum is taken over a short interval of the maximum load within that interval. In each case the interval of maximum load should be definitely specified. The proper interval is usually dependent upon local conditions and upon the purpose for which load factor is to be determined."

Overload Capacity.—The period for which a load factor is given may be a year or a month or whatever else is suitable. The average power is, of course, easily obtained by dividing the amount for the entire period by the number of hours or days which it contains. Sometimes less than the total number of units contained in the period has been used as the divisor to get an average, doubless with reference to industrial limitations upon continuity of operation. This is misleading. But ambiguity is more likely to occur in the determination of the maximum load. If the proper registering devices were installed and the maximum used were the momentary or absolute peak, definition would be easy. But a very large peak that is an affair of a moment may easily be taken care of by overload capacity. Hence, the question is for how long an interval, including the absolute peak, the output should be obtained. The average output for a fifteen-minute interval at the peak would naturally be somewhat higher than that for an hour, and the load factor would be correspondingly affected. Such differences, however, need cause no difficulty, provided it is clear just what figures are used. The load factor may also be stated otherwise than as a ratio (per cent) of average to maximum load, i.e., as the equivalent number of hours' use, per year or other period, of the maximum hour's output or use. This is obtained by dividing the figure for the maximum hour's demand into the total consumption in kilowatt hours for the unit period. This figure for the year, divided into the number of hours in the year, would give the ordinary per cent load factor.

Different Load Factors.—The load factor, or maximum load factor, to be more specific, is, it is to be noted, independent of the capacity of the plant supplying the current. There are other so-called load factors which do take rated capacity of stations, among other things, into account. Though the Standardization Rules of the American Institute of Electrical Engineers should be taken to fix definitely the meaning of the term "load factor" when used in the singular without qualifying phrase, there are other conceptions belonging to the same genus that have been so named and that may well continue to be called load factors with a qualifying adjective.

Capacity Load Factor.—The capacity load factor is the ratio of the average load to the full capacity of the machinery of a power plant. This indicates the portion of the investment not fully and completely utilized, but, unlike

the maximum load factor, it takes no account of whether capacity may not have been unwisely provided in excess of any demand. If there has been wise economy in the estimation of needed capacity, this capacity factor will still vary rather arbitrarily with the reserve capacity originally provided and with the degree to which that reserve has been taken up by recent growth of demand. Still, the capacity factor is a measure of objective economy of investment, though it says nothing about its causes.

Capacity Factor.—The capacity factor never, under the most favorable circumstances, reaches 100 per cent. The necessity of stoppage of machinery for cleaning and repairs and the seasonal variation of demand make such a perfect mark impossible. For gas companies it seems to be agreed by engineers that the limit is about the equivalent of 200 days' use of total capacity in a year. Expressed as a ratio, this is 55 per cent. But the 200-day limit has been in practice considerably surpassed in New York City. No name seems to have been provided for the ratio of maximum demand to full capacity, which is a direct index of the closeness of the "fit" for the time being between investment and demand.

Connected Load.—The connected load is the cumulative capacity of apparatus connected and capable of using current, regardless of the fact that it will never be used all at the same time. It measures potential demand and is the limit of the possible maximum load. The connected load is of significance for motor loads, rather than for lighting customers. For the former it may often be used for comparative purposes in lieu of the maximum load as an index of the peak requirements of different classes of consumers. Of course the maximum is better, but it may not be obtainable.

Demand Factor.—The term *demand factor* has recently been defined by the Standards Committee of the American Institute of Electrical Engineers as the ratio of the maximum power demand of any system or part of a system to the total connected load of the system or part of the system under consideration. The adjustment or lack of adjustment between apparatus installed and its utilization, as shown by this index, is chiefly an affair of the consumer. In rate-making, the estimated demand factor of a consumer serves in conjunction with his connected load as a substitute for the actual measurement of his maximum load. It is thus of practical rather than of scientific interest. The connected load factor, described as the ratio of the average load or demand to the connected load, has also been made use of, though it is not authoritatively defined by the American Institute of Electrical Engineers. It is evident that these ratios are not of so great economic significance as the load factor proper, which makes no supposition as to whether generating capacity and consumers' appliances have been wisely installed or unwisely provided in excess of need. The maximum load factor is entirely a measure of the economic character and variation of demand. It makes practically no assumptions in regard to questions of engineering practice, except as regards measurement standards.

Time of Demand.—Reference has already been made to the analysis of demand to get the load factor for various classes of customers, an analysis which could conceivably be carried even as far as individuals. Though the latter is commercially impracticable, it is clear that the analysis does not go far enough unless the relations between the different sorts of demand are duly taken into account. That a particular class of consumers want their current mainly at some particular hour of the day, that their load factor is, in other words, low, does not in itself determine whether the current they consume is costly as regards fixed investment required. If their maximum demand comes at the general peak it is very costly to supply them, but the more it is concentrated at the hours of small demand the less costly is the current they require. Indeed, though such a peak be very high, the investment in

fixed capital required by it may be nil. Hence, it is important to express the relation between such a class peak and the peak load of the system as a whole. This is provided for by what has been called the *diversity factor.*

Diversity Factor.—The diversity factor measures the difference in time of the maximum of different classes of business. The diversity factor is now authoritatively defined by the standard rules of the American Institute of Electrical Engineers as the ratio of the sum of the maximum power demands of the subdivisions of any system or part of a system, to the maximum demand of the whole system or part of the system under consideration, measured at the point of supply. The diversity factor is an index of the mean variation in time of the maxima of the particular consumers under consideration (or of all consumers) and the power-house maximum (less allowance for transmission, conversion and other losses). It is obvious that dispersion of the maxima may often be more important for system economies than the smoothing out of individual peaks. A favorable diversity factor means a good load factor regardless of inequality in the demand of the individual consumer. Indeed, it is rather desirable that consumers be obtained who have pronounced maxima coming at off-peak times. The maximum demand of an individual consumer may thus be a reason for a low instead of a high rate. The business of park and summer resorts has been much cultivated because of its diversity factor. "Restricted-hour" business in general thus has its reasons for being. But many of these questions are scarcely susceptible of general statistical treatment. The necessary data are obtainable only by the officers of an electrical company that is willing to let them devote much time and expense to the study of such matters.

Rate Theory.—A theory of rates should not be affected by practical limitations upon its application due to lack of statistics and to insufficient development of meters as regards cost, reliability, or adequacy. The rate schedule may, and naturally will, so far as necessary, make use of expert judgment and estimation. Doubtless one reason why the diversity factor is, at least explicitly, little used, is the fact that the available inexpensive demand indicators register the maximum load without giving the time when it occurs.

ELECTRIC RATE REFERENCES.

62—Character of Service.

ELECTRICITY IN KNITTING MILLS, an illustrated article. Electrical Review, 6 pages, Nov. 30, 1912, page 1015.

Electric motor drive is particularly suited to needs of knitting mills. Specific advantages are discussed, and illustrated, and operating data on a number of installations are given in this article.

626—Street Lighting—Manchester (England).

THE MANCHESTER STREET LIGHTING REPORTS, editorial and article, Electrical Times (London), 2½ pages, Oct. 31, 1912, pages 409, 412, and editorial and article, Electrical Review (London), 1¾ pages, Nov. 1, 1912, pages 686, 693.

Owing to the complaint of unsatisfactory street lighting by gas, in Manchester, a test was made by the City Council, by arranging the competitive lighting of two streets of the city, by gas and electricity respectively. The reports give the results, and a comparison of the costs. The data furnished include capital costs, and operating costs, the relative efficiency of the two

installations, arc lamps, and high pressure gas lighting, and prove that for approximately equal illumination, the cost is much lower for electricity, the figures showing more than double expense for gas.

619—Rate Differentials.

New York Edison Company's Answer to Rate Discrimination Charge, Electrical World, 2 pages, Nov. 30, 1912, page 1134.

Gives detailed information as to the cost of supplying service to all classes of customers, and the revenues received from the various sources. Some of the reasons why the wholesale consumer can be served at a lower cost, are, the proportionately less cost chargeable to him for plant equipment, general expenses, such as management, and clerical expenses; better credit; less accounting; less meter reading expenses, etc.; smaller distribution expenses necessary in serving him; better load factor; and larger output required, on which the cost of giving electric service so largely depends.

PUBLIC SERVICE REGULATION.

122— JUST AND REASONABLE CHARGES

The following is a tabulation of all the references to the material compiled in the pamphlet issued by the Department on Regulation of Utilities, of the National Civic Federation, under the title, Basis of Rate Making (Rate Reasonableness), which was abstracted briefly in 2 R. R. 127. (It should be noted that the Department has not placed its final stamp of approval on this work.)

A—GENERAL REQUIREMENTS AS TO REASONABLENESS OF RATES.

Charges shall be just and reasonable.
Unjust and unreasonable charges prohibited and unlawful.

Arizona	Session Laws,	1912, ch. 90,	sec. 13a
California	Stats.,	1911, ch. 14,	sec. 13a
Kansas	Laws,	1911, ch. 238,	sec. 10
Maryland	Laws,	1910, ch. 180,	sec. 13
Nevada	Stats.,	1911, ch. 162,	sec. 5
New Hampshire	Laws,	1911, ch. 164,	sec. 4
New Jersey	Laws,	1911, ch. 195,	sec. 18(a)18(b)
New York	Laws,	1910, ch. 480,	sec. 65
Ohio	Laws,	1911, no. 325,	sec. 15
Oregon	Gen'l Laws,	1911, ch. 279,	sec. 7
Rhode Island	Acts,	1912, ch. 795,	sec. 38
Vermont	Laws,	1908, no. 116,	sec. 11
Washington	Laws,	1911, ch. 9,	sec. 26
Wisconsin	Laws,	1907, ch. 499,	sec. 1797m-3

Rules and regulations shall be just and reasonable.

Arizona	Session Laws,	1912, ch. 90,	sec. 13c
California	Stats.,	1911, ch. 14,	sec. 13c

B—ELEMENTS TO BE CONSIDERED AS A BASIS FOR REASONABLE RATES.

Reasonable value of property devoted to public use.

Kansas	Laws,	1911, ch. 238,	sec. 28
Michigan	Pub. Acts,	1909, no. 106,	sec. 7
Ohio	Laws,	1911, no. 325,	sec. 25

All facts, which in its judgment, have any bearing upon a proper determination.

Maryland	Laws,	1910, ch. 180,	sec. 37
Michigan	Pub. Acts,	1909, no. 106,	sec. 7
New York	Laws,	1910, ch. 480,	sec. 72
Ohio	Laws,	1911, no. 325,	sec. 25

Commission shall give due regard to a reasonable return upon the value of the property.

Michigan	Pub. Acts,	1909, no. 106,	sec. 7
New York	Laws,	1910, ch. 480,	sec. 72

Commission shall give due regard to cost, obsolescence, risk of business, value of service to the consumer, connected load, hours of day when used, and quantity used each month.

Michigan	Pub. Acts,	1909, no. 106,	sec. 7

Commission shall provide for depreciation.

Michigan	Pub. Acts,	1909, no. 106,	sec. 7
Oregon	General Laws,	1911, ch. 279,	sec. 17
Wisconsin	Laws,	1907, ch. 499,	sec. 1797m-15

Commission shall give due regard to the necessity of making reservations out of income for surplus and contingencies.

New York	Laws,	1910, ch. 480,	sec. 72

For surplus, depreciation and contingencies.

Ohio	Laws,	1911, no. 325,	sec. 25

The Commission shall consider local conditions—Rates for like service in different parts of State by any company may be different.

Vermont	Laws,	1908, no. 116,	sec. 10

C—VALUATION OF THE PROPERTIES OF UTILITIES.

Commission may ascertain fair (or reasonable) value of utility property when necessary.

Arizona	Const.,	Art. XV,	sec. 14
California	Stats.,	1911, ch. 14,	sec. 47, 70
Kansas	Laws,	1911, ch. 238,	sec. 28
Maryland	Laws,	1910, ch. 180,	sec. 30
New Jersey	Laws,	1911, ch. 195,	sec. 16 (b)
Ohio	Laws,	1911, no. 325,	sec. 26
Oklahoma	Const.,	Art. IX,	sec. 29

Commission shall value all the property of every public utility.

Oregon	Gen'l Laws,	1911, ch. 279	sec. 9
Wisconsin	Laws,	1907, ch. 499,	sec. 1797m-5

Commission shall ascertain outstanding indebtedness, salaries, and wages of employes, etc.

Oklahoma	Const.,	Art. IX,	sec. 29

Commission shall ascertain the

Cost of construction
Present as compared with original cost
Cost of reproduction
Market value of stocks and bonds
Total market value of the property
Time between construction and dividends first paid
Earning capacity under present rates
Density of traffic and population
Reasonableness of expenditures already made

Washington	Laws,	1911, ch. 117, sec. 92

Valuation shall be so made, that as far as possible it shall not disturb the value of bonds issued prior to the passage of this act.

Maryland	Laws,	1910, ch. 180, sec. 30

Valuation to be made by a disinterested person at expense of applicant.

Michigan	Pub. Acts,	1911, no. 177, sec. 1

Valuation—penalty for over or under valuation.

Ohio	Laws,	1911, no. 325, sec. 83

Companies to assist in valuing property, furnish records, etc.

Arizona	Session Laws,	1912, ch. 90, sec. 47
California	Stats.,	1911, ch. 14, sec. 48, 70
Maryland	Laws,	1910, ch. 180, sec. 30
Oregon	Gen'l Laws,	1911, ch. 279, sec. 40
Wisconsin	Laws,	1911, ch. 499, sec. 1797m-42 (3)

Companies to furnish complete inventory.

Oregon	Gen'l Laws,	1911, ch. 279, sec. 40
Wisconsin	Laws,	1911, ch. 499, sec. 1797m-42 (3)

Commissions to have access to all State records, etc.

Kansas	Laws,	1911, ch. 238, sec. 28
New Jersey	Laws,	1911, ch. 195, sec. 16 (b)
Oregon	Gen'l Laws,	1911, ch. 279, sec. 9

Valuations open to public inspection.

Ohio	Laws,	1911, no. 325, secs. 25, 48, 64

Valuation hearings may be held.

Arizona	Session Laws,	1912, ch. 90, sec. 47
California	Stats.,	1911, ch. 14, sec. 48, 70
Maryland	Laws,	1910, ch. 180, sec. 30
Ohio	Laws,	1911, no. 325, sec. 27
Washington	Laws,	1911, ch. 117, sec. 92

Hearings shall be held.

Oregon	Gen'l Laws,	1911, ch. 279, sec. 10
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-6

Valuations subject to review by Supreme [Superior] Court.

California	Stats.,	1911, ch. 14, sec. 70
Washington	Laws,	1911, ch. 117, sec. 92

Value found by Commission shall be used for assessment and taxation.

Washington	Laws,	1911, ch. 117, sec. 92

Revaluations may be made.

Arizona	Session Laws,	1912, ch. 90, sec. 47
California	Stats.,	1911, ch. 14, secs. 47, 70
Maryland	Laws,	1910, ch. 180, sec. 30
Ohio	Laws,	1911, no. 325, sec. 28
Oregon	Gen'l Laws,	1911, ch. 279, sec. 10
Washington	Laws,	1911, ch. 117, sec. 92
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-7

Commission to keep informed as to new construction.

Maryland	Laws,	1910, ch. 180, sec. 30
Ohio	Laws,	1911, no. 325, sec. 35
Oregon	Gen'l Laws,	1911, ch. 279, sec. 18
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-16

D—SLIDING SCALE, PROFIT SHARING, AUTOMATIC ADJUSTMENT, MINIMUM CHARGE AND GRADUATED CHARGES.

Corporation may enter into an automatic or sliding scale arrangement of charges and dividends for a fixed period, if filed and approved by Commission.

Arizona	Session Laws,	1912, ch. 90, sec. 21
California	Stats.,	1911, ch. 14, sec. 21
Maryland	Laws,	1910, ch. 180, sec. 31½
Massachusetts (Boston Consolidated Gas Act)	Acts,	1906, ch. 422, sec. 1, 6, 9
New York	Laws,	1910, ch. 480, sec. 65 (4)
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-17

Commission may revoke its approval of sliding scale adjustment of charges and dividends, and fix other rates.

Arizona	Session Laws,	1912, ch. 90, sec. 21
California	Stats.,	1911, ch. 14, sec. 21
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-17

Utility may profit from economies, to extent allowed by Commission, for distribution as dividends, etc.

Arizona	Session Laws,	1912, ch. 90, sec. 20
California	Stats.,	1911, ch. 14, sec. 20

Utility may establish sliding scale of charges, if filed and approved by Commission.

Arizona	Session Laws,	1912, ch. 90, sec. 21
California	Stats.,	1911, ch. 14, sec. 21
Ohio	Laws,	1911, no. 325, sec. 19

Utility may enter into arrangement for profit sharing with customers or employes for the distribution of surplus profits, if filed and approved by Commission.

Ohio	Laws,	1911, no. 325, sec. 19

Utility may provide a minimum charge, subject to regulation and change by Commission.

Ohio	Laws,	1911, no. 325, sec. 19

COMMISSION DECISIONS—WISCONSIN.

City of Rhinelander (pop. 5637) v. Rhinelander Lighting Company, complaining of electric rates. Decision of the Wisconsin Railroad Commission, July 11, 1912, adjusting rates. 9 W. R. C. R. 406.

Petitioner alleges that the electric rates of the Rhinelander Lighting Company for light, power and other purposes in the city of Rhinelander, Wis., are unreasonably high. Respondent leases power for electric current from the Rhinelander Power Company and pays a fixed annual amount. The contract limits the sale of current by respondent, to lighting purposes, and to use for electric fans at lighting rates, and the power company reserves the right to sell current for power, and to furnish its power customers with current for light.

315—**Intangibles.**

In the determination of a basis for rate-making purposes, respondent claimed certain intangible values not named in the Commission's valuation. Water power has been substituted for steam power, and respondent contended that the saving resulting from hydraulic generation, represented a contract value. Respondent also claimed a franchise value, based on an estimate of the free service, rendered according to the original franchise. The franchise has been given up for an indeterminate permit, and reliable records of free service during the life of the franchise are not available.

512—**Apportionment of Expense.**

Applicant called in question the amount allowed for wages and salaries, for rate-making purposes. Analysis of comparative data, shows that the normal amount expended for wages and salaries is about 40 to 45 per cent of total operating expenses, modified in individual instances by local conditions. The amount in the present case does not appear to be excessive.

611—**Flat Rates.**

Operating data, desirable for rate-making purposes, were found to be incomplete, and it was necessary to resort to estimates to a considerable degree. Operating expenses seem to have been about normal. Consumer data available, indicate that the flat rate consumers, while using over twice as much current as the metered consumers, furnish little more than one-third of the total commercial revenue. Data also show discrimination that may exist even among the flat rate consumers. The situation is not entirely the fault of the company, but grows, to some extent, from the tendency of consumers

to extend their installations without notifying the company. On account of the difficulties of formulating equitable flat rates, and of the greater difficulties of formulating such rates, side by side with equitable meter rates, the cost analysis is based on the assumption, that all commercial service is to be metered. Free service is eliminated. Operating expenses and revenues determined upon, were apportioned between output and capacity expenses, and further apportioned between commercial service, and municipal arc lighting. Earnings from street lighting appear to be about normal.

315—Intangibles—Water Power.

Held: The title of the owners in utility business, to the entire savings due to use of water power, instead of steam power, has not been clearly demonstrated. To preclude the public from any share in economical methods of service, and to place upon consumers the burden of maximum costs of operation, results in costs that are not dependent upon reasonable efficiency, normal investments, and local advantages. The welfare of the utility requires that mutual benefit arise, from supplying the public from natural power. In the present case, comparison of respondent's contract for hydraulic current, with contracts of other local consumers does not seem to indicate that, from the lessor's point of view, the water power is of more value than the lighting company's rate provided in the original lease. The terms of the lease are such, as to reduce the worth materially below that for power to which exclusive right may be had, and on which no restriction of disposal may be made.

315—Intangibles—Free Service.

Upon the surrender of respondent's original franchise, obligations to supply the city with free service ceased, and the value of such service as may have been subsequently rendered can hardly be made now the basis of a franchise value. It does not appear that a very material sum may be properly added to the valuation on account of operating expenses incurred for free service under the earlier franchise provisions.

612—Meter Rates.

The absence of certain information can hardly be permitted to stand in the way of adjustments, which apparently will lead to greater equity between the utility and the public, and between the different classes of consumers. To completely prevent adjustment and reduction of rates, would add an incentive for failure to provide for ordinary utility records.

A more equitable adjustment of the rate schedule, the elimination of waste of current, and a substantial reduction in charges, will result if all service is metered. Respondent is therefore ordered to install integrating meters within ninety days, on all commercial

service, except for patrolled sign, outline and window lighting, and on the main circuits going out from the substation. It is further ordered that respondent put in effect the rate schedule provided by the Commission, and the meter rates therein established shall become effective for metered use of current for the month of August, 1912.

622—**Small Power.**

Inasmuch as the power company is not prepared, or has not taken the steps necessary to supply general power service, it appears to be unjust to the public to permit the agreement between the parties to the lease to so operate as to place beyond the reach of the public the rates to which it is entitled. The utility which is ostensibly serving the community should be required to furnish that service at reasonable rates, or the concern, which reserves the right to the business, should be ordered to furnish it. Rates for power service are included in the prescribed schedule.

COMMISSION DECISIONS—MASSACHUSETTS

Complaint against the Natick Gas Light Company, of quality and price of gas. Decision of the Board of Gas and Electric Light Commissioners, Oct. 22, 1912, reducing the rate.

35—**Revenue, Expense, Income.**

The Natick Gas Light Company had, for years, maintained differentials, between consumption for lighting, and for fuel, the rate for the former having been, by steady reductions, suggested by the Board of Commissioners, brought down to $1.65 per thousand, while for power and cooking, the rate was $1.50; and had pursued the policy of decreasing the maximum net price, until a uniform price for all purposes should be reached, which proved to be a recognized benefit to the company and the public.

In 1911, upon the company passing into new hands, the operating costs were increased, and to meet this, the rate for gas-stove use was advanced to the maximum net price, $1.65 per thousand, although the rate for power was not disturbed. This action led to the complaint.

Decision of the Commission.

Reduction of rate to $1.50 for all purposes.

That a profit reasonably satisfactory to the former management, was possible at the rates then existing, has been amply demonstrated, nor is it likely that these profits would have been seriously or permanently disturbed, by further reductions of the maximum net rate, in harmony with the suggestions of the Board. . . . It was probably due to the expectation of an early attainment of a uniform price, that the discriminatory conditions which have been described, were allowed to develop.

An attempt arbitrarily to impose the unfortunate results [of the new business methods] upon the public would probably not have been made except for the possession of a monopoly. Operating, as well as investment, expenditures should be directly related to the needs and conditions existing in the community. Unnecessary expenditure in either direction, must be at the risk of the owner. He is bound to have due regard to the needs and reasonable demands of the community to be supplied, when deciding upon the necessity or advisability of expenditures proposed. A reasonable return presupposes reasonable costs, and reasonable costs are determined by a consideration of all the conditions surrounding the business. If a company's methods and general policy be unreasonably costly, or so obviously unwise as to decrease its earning power, or check the growth of its business, these things may be of great importance in determining the amount of a reasonable return. Some of the recent increases in operating costs are probably temporary only, and may not again occur. The reasons for increasing the expenses were insufficient to justify them, if thereby it became necessary to advance the price. The price which is named is sufficient to yield a reasonable return upon the property actually and necessarily employed.

CURRENT REFERENCES

199—General History of Utilities.

The Story of Gas, illustrated article by George B. Cortelyou, President, Consolidated Gas Co., New York City. Public Service, 6 pages. December, 1912, page 245.

Tells how invention has developed gas into one of the greatest forces of civilization.

315—Intangibles.

Intangible Values of Electric Light and Power Companies, by William J. Hagenah, a 20-page pamphlet. This was read before the convention of the Northwest Electric Light and Power Association, and referred to in 2 R. R. 14. It is now published by the Northwest Electric Light and Power Association, and may be obtained from the Secretary, Mr. Norman W. Brockett, 219 Pioneer Bldg., Seattle, Wash., at the rate of five cents per copy.

32—Depreciation.

Should Public Service Properties Be Depreciated to Obtain Fair Value in Rate or Regulation Cases, by James E. Allison, Commissioner, and Chief Engineer, of the St. Louis Public Service Commission, Electrical World, Nov. 30, 1912, page 1138.

This is an argument that a depreciation reserve fund is unnecessary, and

that it is, consequently, improper to deduct depreciation, from reproduction cost, in arriving at the fair present value, stating,

> In most valuations of public utilities, we are dealing with a situation where there has been in the past no regulation of rates, based upon a reasonable return, and where there has been no legal requirement of a depreciation fund. . . . The conclusion seems clear, then, that in all cases of heretofore unregulated properties, we cannot justly depreciate to obtain fair value, unless we admit the justice of *ex post facto* laws, or equivalent regulation, or unless we interpret fair value, to mean market value, and not just amount.

32—Depreciation.

THE LIFE OF PLANT, Electrician (London), 2 pages, Nov. 8, 1912, page 182.

Gives data of electrical properties showing that 20 to 25 years is by no means a limiting period for the life of mains, and that a generating plant may have a useful life of 20 years, or perhaps more, obsolescence, however, being an important factor; and points out the need of setting aside from earnings a substantial fund for the replacement of plant.

33—Capitalization.

COMPARISON OF CAPITAL VALUES—AGRICULTURE, MANUFACTURES, AND THE RAILWAYS, Bulletin No. 39 of the Bureau of Railway Economics, Washington, D. C., 1912. A 38-page pamphlet.

This study of capital values of agricultural, manufacturing, and railway industries in the United States, and their comparison, gives much interesting information, both as to facts, and methods of making such a comparative study. It covers the twenty-year period from 1890 to 1910, for railways and agriculture, and the ten-year period from 1900 to 1910, for manufactures.

91—Promotion and Growth of the Business.

HYDROELECTRIC ENERGY FOR COAL FIELDS, illustrated article, Electrical World, 3½ pages, Nov. 30, 1912, page 1141.

The Appalachian Power Company has completed two plants, totaling 29,000 horse power, of the five water-power sites, it has planned to develop, on the New River, in Virginia. Describes, with a map, plans, and illustrations, the service and distribution system, which are furnished to the coal fields, and surrounding agricultural country.

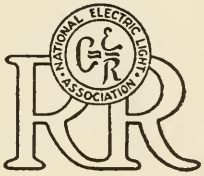
99—Employes.

ELECTRICAL INJURIES, THEIR CAUSATION, PREVENTION AND TREATMENT, DESIGNED FOR THE USE OF PRACTICAL ELECTRICAL MEN, by CHARLES S. LAUFFER, M.D. John Wiley & Sons, New York, 1912. 77 pages. Price, 50 cents, postpaid.

This is a brief and conveniently arranged presentation of this subject.

Vol. 2 December 11, 1912 No. 11

RATE RESEARCH



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120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

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Rate Research

Vol. 2. CHICAGO, DECEMBER 11, 1912 No. 11

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATE RESEARCH COMMITTEE NEWS

The Rate Research Committee recognizes that there are many practical reasons why uniform rate methods cannot at once be adopted throughout the country. A forward step which would greatly improve the general situation, can however, be made at this time, and the first essential is a clear understanding of the rates upon which the average commercial schedule is based. The Committee in its deliberations has considered the following:

A. GENERAL LIGHTING RATE.

B. GENERAL POWER RATE.

These two rates are advantageous for the small users, and in some instances are combined as a GENERAL LIGHT AND POWER RATE.

C. LARGE LIGHTING RATE.

D. LARGE POWER RATE.

These rates are advantageous for large users and again in some instances are combined as the LARGE LIGHT AND POWER RATE.

E. FEATURE RATES.

A low temporary rate, advantageous to consumers whose use has special features, and where the result in combination with other rates is for the advantage of the consumers as a whole.

An analysis of any rate schedule shows theses rates, or some combination thereof, as the basic rates of every schedule. There are, of course, many other rates submitted by the companies as corollaries to these basic rates, as for instance:

A. Residence lighting rates, street and ornamental lighting rates, hall lighting rates, commercial lighting rates.

B. Commercial power rates, yearly power rates, elevator rates.

C & D. Theater rates, subway and tunnel building rates, street railway rates.

E. Storage battery rates, ice-making rates, limited-hour service rates, sign rates.

EDITORIAL NOTE.—All indented matter is direct quotation.

Some of the companies have as high as thirty or forty different rates, but the general tendency is towards fewer rates, and a careful study of the above basic rates may help the companies in a study of any contemplated schedule revision.

For any one of these basic rates, a company may adopt any one of the following standard rate systems:

1. STRAIGHT LINE METER RATE.
2. BLOCK METER RATE.
3. TWO-CHARGE DEMAND RATE (WRIGHT).
4. THREE-CHARGE RATE (DOHERTY).
5. HOPKINSON DEMAND RATE.

NOTE.—The Rate Research Committee has recommended to the Committee on Terminology that the Demand Rate with separate demand and energy charges, be definitely called the "Hopkinson Rate" in honor of the late Dr. John Hopkinson. This will make an easy identification of this rate and prevent its confusion with the other types of demand rates.

There are some companies that have adopted pure rates on the above systems and it seems very desirable that as new schedules are adopted, the actual standard form of the rate, without modification, be used. This is not as difficult as it may at first appear because the standard form can be adjusted, and the same rate curve obtained throughout, as by a more complicated modification of the rate form itself.

An investigation of many of the old schedules or contract forms usually leads to the conclusion that it was not safe to make any calculation as to what a particular rate might be under such schedule, and as a rule, only those who were daily figuring the rate can make the calculation with accuracy. This should not be so.

A proper rate should have no hidden or indefinite features or charges. It should be easy to figure. Where the system itself is complicated, as in some of the demand rates, every effort should be made to have the details seem straightforward, and all rate sheets arranged in a uniform manner.

As a matter of fact under regulation by commission, the careful arrangement of rates and schedules is much more important than the attempt at full legal protection, through long and complicated clauses, against every possibility of claim.

With this in mind, the Rate Research Committee has selected from the schedules submitted, certain rates which are typical examples of the base rates, and standard form of rates recommended, and it is planned to print in RATE RESEARCH a series with the exact wording that the Committee recommends should be used, in describing such rates.

The Committee desires to point out that, the filing of a rate schedule on the uniform basis recommended, does not mean the changing of a single contract form. It means only the standardization of the method of presenting to the consumer, and to the public, the actual facts contained in the contract in such a way that all possible questions are answered by the schedule itself.

The first series of standard rate sheets are given on the following pages and illustrate how the rate sheet can be made from a rate contract in use, actual examples being given from the different cities.

GENERAL LIGHTING RATE.

Straight Line Meter Rate,	Boston.
Block Meter Rate,	New York.
Two-Charge Demand Rate,	Chicago.
Three-Charge Demand Rate,	Denver.
Hopkinson Rate,	Cambridge, Mass.

A NEW MEMBER.

President Tait has appointed as an additional member to the Rate Research Committee, Mr. Edwin Gruhl of New York, Assistant to the President of the North American Company. Mr. Gruhl was formerly Chief Statistician of the Wisconsin Railroad Commission.

RATE RESEARCH DUTY FREE IN CANADA.

The Rate Research Committee is glad to announce that the Customs Postal Branch of the Port of Toronto, has finally decided, under date of December 5th, to classify RATE RESEARCH as duty free. The Customs Branch had held up several issues, and we are glad to advise Canadian subscribers that future numbers will be delivered without any delay.

Original Sheet No. 3

Ed. Elec. Ill. Co. of Boston. Schedule No. 1

GENERAL LIGHTING RATE

ADVANTAGEOUS FOR THE SMALL USER

Available for all consumers using the Company's standard service.

Rate.
10 cents per kilowatt-hour.

Discounts.
None.

Minimum Charge.
At the rate of $12.00 per year per meter.

Breakdown or Auxiliary Minimum.
If the Company's service is used as auxiliary to any source of electric power, $3.00 per kilowatt per month demanded by the consumer.

Lamp Renewals.
The rates given above include the supply and renewal of all standard incandescent lamps, as given in detail on Sheet No. 10.

Standard Riders.
None applicable to this contract.

Term of Contract.
Service continues until ten days after written notice to discontinue by either party.

Terms and Conditions.
See Sheet No. 11.

(Standard Size 8x11 inches.)

Date of Issue, February 1, 1912. Date Effective, March 1, 1912.

Issued by The Edison Electric Illuminating Co. of Boston
39 Boylston Street, Boston, Mass.

Schedule No. 1 Revised Sheet No. 2

N. Y. Ed. Co. Cancels Sheet Effective March 1, 1909

GENERAL LIGHTING RATE

ADVANTAGEOUS FOR THE SMALL USER

Available for all consumers using the Company's standard service, to the exclusion of any other electric service, on the same installation.

Rate.

The first	250	k. w. h.	of monthly consumption	at	10	cents	per	k. w. h.
Next	250	"	"	"	"	9	"	"	"
Next	250	"	"	"	"	8	"	"	"
Next	250	"	"	"	"	7	"	"	"
Next	500	"	"	"	"	6	"	"	"
Excess over	1500	"	"	"	"	5	"	"	"

Discounts.

As given in rate.

Minimum Charge.

None.

Lamp Renewals.

These rates include the supply and the renewal of all standard incandescent lamps and carbons for and trimming of arc lamps, as noted on Sheet No. 17.

Standard Riders.

Applicable to this contract: Nos. A1, A2, A3, A4, A6, A7, 7, A8, A9, A10, A11, A12, A13, see Sheet No. 24.

Term of Contract.

Service continues until three days after written notice to discontinue by either party.

Terms and Conditions.

See Sheet No. 29.

(Standard size 8x11 inches.)

Date of Issue, May 13, 1911 Date Effective, July 1, 1911

Issued by New York Edison Company
55 Duane St., New York, N. Y.

Original Sheet No. 3

Com. Ed. Co. (Chicago). Schedule No. 5.

GENERAL LIGHTING RATE

ADVANTAGEOUS FOR THE SMALL USER

Available for all consumers using the Company's standard service, to the exclusion of any other electric service, on the same installation.

Rate.
11 cents per kilowatt-hour for the first 30 hours use per month of maximum demand.
6 cents per kilowatt-hour for excess use.

Determination of Demand.
By actual measurement by demand indicators, except where capacity of consumers installation is less than one kilowatt, the maximum demand will be estimated, as follows:

A—Number of 50 watt lamps connected or their equivalent.
B—Kilowatt-hours at full rate per month (commercial).
C—Kilowatt-hours at full rate per month (residence).

A	B	C	A	B	C	A	B	C	A	B	C	A	B	C
1	2	2	5	8	7	9	12	10	13	16	12	17	20	14
2	3	3	6	9	8	10	13	11	14	17	13	18	21	15
3	5	5	7	10	9	11	14	11	15	18	13	19	22	15
4	6	6	8	11	10	12	15	12	16	19	14			

Discount—Prompt Payment.
One cent per kilowatt-hour when bills are paid on or before ten days after their respective dates.

Minimum Charge.
None.

Lamp Renewals.
The rates given above include the supply and renewal of all standard incandescent lamps as given in detail on Sheet No. 32.

Standard Riders.
Applicable to this contract, Nos. 1, 4, 6, 7, 12, 13, 14. See Sheet No. 31.

Term of Contract.
Service continues until written notice to discontinue by either party.

Terms and Conditions.
See Sheet No. 30.

(Standard size 8x11 inches)

Date of Issue, April 1, 1912. Date Effective, October 1, 1912

Issued by Commonwealth Edison Company
120 West Adams St., Chicago, Ill.

Original Sheet No. 3

Denver G. & E. L. Co. Schedule No. 1

GENERAL LIGHTING RATE

ADVANTAGEOUS FOR THE SMALL USER.

Optional for all consumers using the Company's standard service.

Rate.
Customer charge—$9.00 per year.*
Demand charge—$36.00 per year per kilowatt connected.*
Energy charge—5 cents per kilowatt-hour for all electricity used.
*One-twelfth payable each month.

Determination of Connected Load.
(Assumed lamp rating should here be given.)

Discount—Prompt Payment.
10 per cent when bills are paid on or before ten days after their respective dates.

Minimum Charge.
As given in the rate.

Lamp Renewals.
The rates given above include the renewal of all standard incandescent lamps, as given in detail on Sheet No. 12. (First installation must be paid for by customer.)

Standard Riders.
None given.

Term of Contract.
Contract continues for at least one year, and thereafter until 30 days written notice by either party.

Terms and Conditions.
See Sheet No. 11.

(Standard size 8x11 inches.)

Date of Issue, May 15, 1906. Date Effective, May 15, 1906

Issued by the Denver Gas and Electric Light Company
900 Fifteenth Street, Denver, Colo.

Original Sheet No. 3

Cambridge E. L. Co. Schedule No. 1

YEARLY LIGHTING RATE

ADVANTAGEOUS FOR THE LONG HOUR USER

Available for all consumers using the Company's standard service, except breakdown or auxiliary service to any other source of power.

Rate.
Demand Charge—$48.00 per year per kilowatt contracted for.
Energy Charge—6 cents per kilowatt-hour for all electricity used.

Discount.
None.

Minimum Charge.
No contract will be made for less than one-fourth kilowatt per month.

Lamp Renewals.
The rates given above include the renewal of all standard incandescent lamps, as given in detail on Sheet No. 12. (First installation must be purchased from the Company.)

Standard Riders.
None given.

Term of Contract.
Contract continues for at least one year, and thereafter until written notice by either party.

Terms and Conditions.
See Sheet No. 11.

(Standard Size 8x11 inches.)

Date of Issue, June 1, 1911. Date Effective, July 3, 1911

Issued by Cambridge Electric Light Company
Western Ave. and Blackstone St., Cambridge, Mass.

RATE REFERENCES

COURT DECISIONS

51—Cost of Service Theory.

Suit by the Louisiana Railway and Navigation Company v. Railroad Commission of Louisiana, to enjoin enforcement of order fixing rates on petroleum. Decision of Supreme Court of Louisiana, annulling the order. Oct. 21, 1912. 59 Southern Reporter, 820.

> A reduced rate on a particular commodity, cannot be said to be reasonable and just, when it is established without regard to whether the existing rate is high or low, as compared with rates on other commodities, and without regard to whether it will pay the cost of service rendered, or yield a fair return to the carrier upon the capital invested.

619—Rate Differentials.

Complaint against Detroit City Gas Company, Detroit, Mich. (pop. 465,766), charging discrimination. Decision of the Supreme Court of Michigan, upholding the company's rates. 152 Mich. 654. Gas Record, Nov. 25, 1912, p. 21.

The company, in accordance with an ordinance of the city council, uses differential rates for the sale of gas, for lighting, 90 cents per thousand, for fuel, 80 cents, and for power, 60 cents. A lighting customer refused to pay his bill as per this schedule, and tendered payment at the 60-cent rate. This the company refused, and threatened to remove the meter, and discontinue supply of gas. The decision finds the schedule lawful.

74—Safety of Service.

Suit against Salt Lake and Ogden Railway (Farmington, Utah, pop. 1,231) et al., to recover damages for personal injury. Judgment for plaintiff, affirmed on appeal. Decision of Supreme Court of Utah, Sept. 28, 1912. 127 Pacific Reporter, 267.

A joint judgment against the Home Telephone and Electric Company, and the Salt Lake and Ogden Railway Company, was given in District Court. The railway company alone appealed.

> The allegations of negligence against [the company] in substance are that [it] . . . had negligently and carelessly placed and maintained on certain poles, certain wires, which continuously carried a dangerous quantity of electricity, to wit, 40,000 volts; that said wires were placed in close and dangerous proximity to the poles and wires of the telephone company, to wit, "within about one foot thereof"; that the wires . . . aforesaid were by it, negligently and carelessly suspended, in such proximity to the poles and wires of the telephone company, that . . . wires charged with said quantity of electricity were "extremely dangerous to the safety and lives of the employes of the defendant Home Telephone Company in climbing and working on its poles."

71—Conditions Precedent to Service.

Suit by STATE EX REL. MASON v. CONSUMERS' POWER COMPANY (St. Paul, pop. 214,744), to compel electric service. Decision of Supreme Court of Minnesota, directing company to furnish service. 137 Northwestern Reporter 1104.

> Unquestionably, then, it was, and is, the respondent's duty to supply, without discrimination, electric service to all citizens of St. Paul, whose property is so situated as reasonably to entitle them thereto, under the ordinance and under the general law applicable to public service corporations, and to refrain from unjust discrimination between such citizens. . . .
>
> "The law requires them," said the court in Chesapeake, etc., Telephone Co. v. Baltimore, etc., R. Co., 66 Md. 399, 7 Atl. 809, speaking of telephone companies, "to be impartial, and to serve all alike, upon compliance with their reasonable rules and regulations." It appears that the relator has had his house wired and equipped for the use of electricity, that he has made due application for service, has followed this with a formal demand therefor, and now holds himself ready to comply with any and all lawful conditions, that may be imposed by the respondent. . . . and yet [company] refuses to furnish it, basing such refusal flatly, . . . solely upon the ground that the relator has not procured for it a right of way to his premises. . . .
>
> In our view of the case, . . . in other words, the consent of the city, if necessary, is merely one of the incidental details involved in the performance of the respondent's ultimate duty, to furnish light to those properly applying therefor. These matters, as we have already noticed, are usually looked after by the public service companies, and not by the applicants for service. . . .
>
> The respondent has not required other patrons and applicants to procure for it a right of way upon, and across, the streets necessarily used, or crossed, in carrying the service to them, and . . . such is not the respondent's usual custom. And it follows that, in requiring this of the relator, the respondent has discriminated against him.

41—Terminology.

AN EXTENSION OF THE DEWEY DECIMAL SYSTEM OF CLASSIFICATION APPLIED TO THE ENGINEERING INDUSTRIES, by L. P. BRECKENRIDGE, and G. A. GOODENOUGH. Bulletin No. 9 of the Engineering Experiment Station, of the University of Illinois. Revised edition, 1912, 117 pages. 50 cents.

This gives a complete classification of engineering in all its branches, with a table of class numbers, an introduction containing an explanation of the system, and its advantages, and a relative index (alphabetical), of the items of the classification, each with its proper class number.

453—Load Factor.

SALE OF ELECTRICAL APPLIANCES FOR REGULAR LAMP CIRCUITS, AND THEIR EFFECT ON LOAD AND INCOME, by S. M. KENNEDY, Electrical World, 3 pages, Dec. 7, 1912, p. 1209.

Gives an outline of the methods used by the Southern California Edison Company, headquarters Los Angeles, in introducing domestic appliances, with tables giving the results in sales, and curves showing the load improvement.

453—Load Factor.

READINESS TO SERVE METHODS, THE UTILITY VERSUS AGRICULTURAL SALES, by ROSS D. MATEER, Journal of Electricity, Power and Gas, 1 page, Nov. 30, 1912, p. 478.

Suggests the best methods of extending electric service for agricultural uses; which means to the company a better load factor, and, experience shows, is profitable to the farmer, and to the utility.

49—General Technical Information.

PLOTTED CURVES AND CURVE SHEETS, BY PROFESSOR E. B. SMITH, Engineering News, Nov. 21, 1912, p. 965.

Gives some rules of proper practice in preparing curve-sheets.

51—Cost of Service Theory.

RATE FOR ELECTRICITY, by HENRY D. JACKSON, Engineering Magazine, 8 pages, Dec., 1912, p. 326.

Claims that the proportion of the fixed charges and operating charges, assigned to large power users, and electric signs, is unjustly low, and so works a hardship on the small consumer.

Mr. Jackson is a Consulting Engineer in Boston, and this is the second paper (See 2 R. R. 123) he has recently written claiming that Central Stations are selling power below cost. The value of the papers can be understood from the following quotation:

> There has been more or less complaint regarding the rates for lighting and power as furnished by many public service corporations, and the fact that these complaints are not confined to any locality would lead one to believe that there must be a reason for them. . . .
> It is very doubtful if the gain from the power load, which must of necessity be sold at a low price, is sufficient to compensate for the increased fixed charges necessitated by its development. . . .
> There are opportunities other than power, however, for increasing the plant load during the day and during the night, or during non-peak hours. . . . Under these conditions, the loss of the power load would work no hardship on the supply company, and a proper arrangement of the rates would place the burden of expense where it belongs. At the present time the small consumer is paying the freight to carry the large consumer, and the power load.

6—Rate Practice.

SOME PRINCIPLES AND FACTS THAT SHOULD BE CONSIDERED IN MAKING RATES FOR ELECTRICAL UTILITIES, by Commissioner Halford Erickson, 36 pages.

This important paper, presented before the Ohio Electric Light Association, in July, 1912, is now reprinted, together with the discussion of it, by the members, at the convention.

51—Cost of Service Theory.

Report of Committee for Determining the Proper Basis for Rates and Fares, editorial, and article, Electric Railway Journal, 10 pages, Nov. 30, 1912, p. 1095 and p. 1103, and Aera, 42 pages, Dec., 1912, p. 373.

This work was done by the Committee on Rates and Fares of the American Electric Railway Association, following instructions

> to work out a theoretical basis for determining fares on properties having annual gross earnings (operating revenues) of from $100,000 to $5,000,000, . . . taking into account particularly the factors of mileage, population, character of construction, providing for all operating expenses, taxes, fixed charges, depreciation and suitable return on investment, based on a twenty-year franchise, and also on an unlimited franchise.

The article gives in detail three separate memoranda of the subject, first, The Theoretical Basis for Determining Fares on Properties, having Annual Earnings of from $100,000 to $5,000,000; second, Actual Figures of Existing Street Railways; and third, Passenger Rates, and Fares, in Cities with Surface Street Railways, and Elevated Railroads, or Subways.

The figures obtained through these studies confirm the conclusions of its previous report, that the street railway business in this country is "selling goods below cost." The Committee recommends that the report be printed and distributed to the members of the Association, so that full discussion may be had at the mid-winter meeting, Jan. 31 next.

75—Adequacy and Efficiency of Service.

Liability of Central Stations for Failure of Supply, by M'Guire and Mooney, Electrical Review, 1¾ pages, Dec. 7, 1912, p. 1079.

This is a brief summary of the law on this subject, quoting several interesting decisions. A company is liable for damages if it refuses, without sufficient reason, to furnish current, unless the contract particularly relieves it from continuous service. Interruptions from act of God do not render it liable, and it may refuse service where premises are improperly wired, or where a customer is stealing current.

619—Rate Differentials.

Justification of Deviations in Rates for Electrical Service, by S. M. Kennedy, Journal of Electricity, Power and Gas, 2 pages, Nov. 30, 1912, p. 479.

States there are three fundamental factors which must be considered as forming a basis in charging for electric service, namely, quantity, demand, and hours of use, and gives the main classifications of power business, and deviations in the standard schedule, used by the Southern California Edison Company, for power.

62—Character of Service.

Electricity in Metal Mining in Colorado. Illustrated article, Electrical World, 5¼ pages, Dec. 7, 1912, p. 1194.

Because of its adaptability and low cost, as compared with other forms of power, electricity has wide application for driving hoists, pumps, drills, fans, railways, and in various processes directly connected with the recovery of precious metal from ore.

PUBLIC SERVICE REGULATION

2—**Public Service Regulation.**

The National Civic Federation, Department on Regulation of Public Utilities, New York, announces the near completion of the important work of its investigation of regulation of public utilities. The plan of the study includes.

1. Compilation of Regulatory Laws, Analyzed and Annotated.
2. Formulation of Model Public Utilities Bill.
3. Special Report on Regulation of Capitalization, Sliding Scale, Profit-Sharing.
4. Study of State versus Municipal Regulation.

Of the first division of the work, three parts have appeared, and were abstracted in 2 R. R. 56, 128, 148.

The Formulation of Model Public Utilities Bill should be of special value in States now considering the adoption of public service regulation, as Illinois, Indiana, Pennsylvania, Kentucky and elsewhere, and it is anticipated, will be of great interest to utility companies, and all others concerned in securing such regulation as will be fair and just both to utilities, and the public.

The Special Report on Regulation of Capitalization, Sliding Scale, and Profit Sharing, deals with subjects that are now claiming much attention in utility management. Dr. Robert H. Whitten, Librarian-Statistician, Public Service Commission, New York City, and author of "Valuation of Public Service Corporations," has made an exhaustive study abroad for this work, and the report should be valuable.

The Study of State versus Municipal Regulation, may be of service in obtaining wise legislative action in Illinois, where the subject is being agitated at present, and in California, where efforts are being made to have regulatory powers transferred from municipalities to the State Commission.

This broad and disinterested investigation by the Civic Federation is timely, and will make for economy and efficiency, by providing greater clearness, order and standardization than have as yet prevailed in public service regulation.

CURRENT REFERENCES

131—**Protection of the Corporation—Confiscatory Rates.**

Des Moines Gas Company v. City of Des Moines et al. 199 Federal Reporter 204.

This case, abstracted in 2 R. R. 6, may be found in full as above.

13—Protection of the Corporation.

RULES OF PRACTICE FOR THE COURTS OF EQUITY OF THE UNITED STATES, promulgated by the Supreme Court of the United States, Nov. 4, 1912. 46 pages.

This is Vol. 33, No. 1, of the Supreme Court Reporter, Dec. 1, 1912, and contains, besides the Court Rules, an alphabetic index of 12 pages, of the items covered by the rules.

14—Relations of Corporations With Each Other.

COURT DECISION IN RELATION TO CENTRAL STATION COMPETITION AT LOUISVILLE, KY. Electrical World, Dec. 7, 1912, p. 1183.

This decision preventing the sale of the Kentucky Electric Company to any other competing company, contains this statement of the argument for competition,

> That a stockholder may go upon the market and sell his stock in the ordinary course of trade, cannot be denied; but conspiring and confederating for the purpose of doing that which is denied by an ordinance, can, and should, be enjoined. While it is true that, at common law, the shareholder's identity is separate from that of the corporations, a court of equity has always looked to the substance, and not to the form, and in a proper case, will control a corporation through its shareholders, as well as by any other means. The establishment of a monopoly, with the consequent oppression, is abhorrent to society and the law, and a court of equity will look beyond a fiction, in order to enforce a contract designed to prevent a monopoly.

2—Public Service Regulation.

PUBLIC SERVICE AND THE PUBLIC, address by Commissioner Milo R. Maltbie, to officers and employes of the New York Edison Company. Electrical World, Dec. 7, 1912, p. 1179.

Points out that because of the differences between private business, and that of public service corporations, regulation is needed, and mentions as some of its benefits, having an arbiter by whom differences between a company, and its customers, can be amicably adjusted; the protection afforded security holders; and the satisfaction to both company and customers from meter tests made by the commission.

313—Prices.

NOVEMBER PRICES OF ENGINEERING MATERIALS. PRICE CHANGES AND THE BUSINESS OUTLOOK. Engineering News, 6 pages, Dec. 5, 1912, p. 371.

99—Employes.

GRADED INSTRUCTION IN RATE MAKING AND RATE APPLICATION, Electrical World, Dec. 7, 1912, p. 1208.

The Union Electric Light and Power Company of St. Louis, has organized a school to train employes in its sales department, in the practical aspects of making rates for electrical energy.

Vol. 2 December 18, 1912 No. 12

RATE RESEARCH

PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

Vol. 2. CHICAGO, DECEMBER 18, 1912 No. 12

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATE REFERENCES

COMMISSION DECISIONS—WISCONSIN

132—**Protection of the Corporation from Competition.**

Investigation by WISCONSIN RAILROAD COMMISSION, on its own motion, of the rates, rules and regulations of THE MILWAUKEE ELECTRIC RAILWAY AND LIGHT COMPANY; PLANKINTON ELECTRIC LIGHT AND POWER CO.; COMMONWEALTH POWER CO.; WELLS POWER CO.; RAILWAY EXCHANGE BUILDING CO.; COLBY & ABBOTT BUILDING CO.; MOLITOR & HUMMELL REALTY CO. Opinion and Decision of the Commission. August 20, 1912.

122—**Just and Reasonable Charges—Discrimination.**

Complaint was made that discriminatory practices were resorted to among competing companies furnishing electric current in Milwaukee, Wis. The T. M. E. R. & L. Co. petitioned for the establishment of such rates, rules and regulation for the utilities involved as would put a stop to the practices complained of. The Plankinton Lt. & P. Co. made a similar complaint, and asked for authority to put into effect a lower rate schedule, whenever necessary to protect its business from the encroachment of the Commonwealth P. Co. . . .

132—**Protection of the Corporation from Competition.**

The franchise of the T. M. E. R. & L. Co. covers the entire city and this company comes in competition with all the other companies named. The franchises or rights of the other companies appear to be limited to certain sections of the city. The companies maintain separate schedules and sets of rules and regulations. The T. M. E. R. & L. Co. is so situated that when all the factors are taken into consideration, such as reserve requirements, size of its business, and provision for extra demand that may arise, it is quite obvious that the plant and equipment cannot be much, if any, smaller than would be required if it had to furnish all the services for the entire city. The city, however, adopted the policy of permitting other companies to come in and share or compete for the business. The result is that in this city much more property,

EDITORIAL NOTE.—All indented matter is direct quotation.

supplies, labor and services of all kinds are employed in furnishing electric energy for light and power than would be the case if one company with one set of organizations gave this service. These duplications cost money, cause greater depreciation and interest charges, as well as higher operating expenses than would otherwise be needed, which falls as an increased burden on the people served. . . .

132—**Protection of the Corporation from Competition.**

If special inducements are offered by any company, in order to secure additional business, under such competitive conditions as prevail in the present case, it would lead not only to unjust and serious discriminations, but to rate wars from which, in the end, only harm can come to the public.

Competition, in the very nature of things, cannot be a proper regulator in the public utility field. Competition means duplication of plants, excessive fixed and operating expenses and useless outlay. It stands for unnecessary tearing up and occupation of already overcrowded streets and alleys, the possible duplication of services on customers' premises and for many other inconveniences and costs.

In the public utility field, rate wars are so clearly against public policy, that they should not be permitted under any circumstances. It is clearly in order to enable this Commission to prevent or stop such struggles that Section 1797m-99 was included in the Public Utilities Law.

HELD: Public interests require that the rates, rules and regulations complained of should . . . be so altered and amended as to, as far as is both just and practicable, place the contending utilities in relatively the same position, with reference to their customers, or the business to be had, and so as to eliminate as far as possible, such discrimination, as between customers and others, which are unjust and inimical to public interests.

The opinion also recites a former decision of the Commission

LaCrosse G. & El. Co. 1907.....2 W. R. C. R. 3, 5

and the following important decisions by the New York and Massachusetts Commissions, and by the Supreme Courts of New York and Massachusetts, condemning competition between public utilities:

Lockport Lt., Ht. & P. Co. et al. 1907.....1 P. S. C. Rep. (2nd Dist. N. Y.) 12, 21, 22

Mass. G. & El. Lt. Comm. 9th Ann. Rep. 1893.....23-26

Mass. G. & El. Lt. Comm. 19th Ann. Rep. 1903.....24-25

Weld v. G. & El. Lt. Comm. 1908.....197 Mass. 556, 558, 559

Matter of Attorney-General, 1908.....124 App. Div. (N. Y.) 401, 406-408.

619—Rate Differentials.

The T. M. E. R. & L. Co., Commonwealth Co. and the Plankinton Co. have a maximum demand schedule, which is the same for the three companies. . . . limited by increment rate schedules applied as maximum rates. For power, these increment or maximum schedules are also the same for all three companies, but for lighting, the increment or maximum schedules differ. It appears that, during the past few months, the Commonwealth Co. has carried on an aggressive campaign for new business . . . it has so interpreted its rate schedule, that it could apply its increment, or maximum power rates, for light, as well as power purposes. These increment power rates, for certain classes of users, are as much as 2 cents per kilowatt hour lower than its own increment lighting rates, and for certain classes, 4 cents lower than the increment lighting rates of the Plankinton Co. and T. M. E. R. & L. Co. The Commonwealth Co. justified this practice by a paragraph in its rate schedules, which provides a reduced rate . . . to customers not receiving free renewals of the company's standard lamps. . . . [These] were allowed a reduction of 2 cents per kilowatt-hour. The cost of lamp renewals does not exceed $\frac{1}{2}$ cent per kilowatt-hour, and it is a serious question whether this practice is not unlawful as well as unjust. Certain other practices were also employed, in order to obtain business, not always in line with the provisions in the rate schedule. The T. M. E. R. & L. Co. has . . . in effect many rates which appear discriminatory. Concerning the remaining companies, little or nothing was brought out, to show that . . . they attempted to secure new business by any such methods as those complained of.

Held: The practice of substituting power rates, instead of the lighting rates properly applicable under the schedules, in the present case, results in unjust discrimination.

42—Measurement of Demand.

It appears to have been the practice of several companies to allow an occasional variation, from the maximum demand, for power service, of about $33\frac{1}{3}$ per cent. The justification for this practice lies in the fact that power service, unlike lighting service, seldom, if ever, occurs upon the winter peak. No objections can be found to this rule, if it is consistently applied.

The method of determining the demand charge in the present case, was questioned. The general practice of companies using the demand schedule, is, to base the determined demand upon the greatest rate at which electric energy is used by the customers for fifteen consecutive minutes, and no objection can be found to this practice if it is uniformly applied. It is the obvious intent of the

present schedule, that the demand charge be assessed upon the basis of the maximum demand for the year, and be payable in twelve monthly installments. Such maximum demand, for lighting service, usually occurs during the winter months. Where service is connected during the summer months, and the demand is unknown, some temporary assessment must be made of the demand charge, until the differences between the estimated demand, and measured demand, can be accurately determined. It appears that it has been the practice of a number of companies in the present case, to determine the demand monthly, thus placing at a disadvantage the consumers who connect for service during the winter months.

HELD: Where the intent of the schedule is to base the demand on the maximum demand for the year, the practice of assessing it on the monthly basis results in discrimination.

97—**Other Business of Utilities.**

Discrimination seems to have resulted in the present case from the practice of furnishing fixtures and other items at or below cost in order to secure customers. The cost of fixtures depends upon the character of the building, the taste of the customer, and other local conditions, and after installation, this equipment is practically out of the company's control. When the fixtures are furnished by the company, the cost becomes a part of fixed charges, and operating expenses, and is borne by the consumers irrespective of their individual equipment.

HELD: Since the costs for fixtures depend on different causes and units than the other costs of service, they cannot often be equitably distributed among the consumers unless they are paid for directly. In the present case, the fixtures should be paid for by the customer directly, at ruling prices. Any other practice in the struggle for business, will lead to all sorts of preferences and irregularities.

69—**Rate Schedules.**

On the whole, the present schedules of the companies are fully as high as they should be. Certain reductions and modifications should be made in the demand, and other rates, in so far as they affect business lighting and power. . . .

The companies are ordered to abandon their present schedules for commercial lighting and power service, and substitute the following standard rates, which have been rearranged to follow the form recommended by the RATE RESEARCH COMMITTEE.

GENERAL LIGHT AND POWER RATE

Available for all consumers using Company's standard service.

Rate—Demand Charge.

$42.00 per year per kilowatt for the first 10 kilowatts of maximum demand.
30.00 " " " " " " next 50 " " " "
24.00 " " " " " any excess " " " "

Energy Charge.

4 cents per kilowatt-hour for first ..... 1000 kilowatt-hours per month.
3 " " " " " next ..... 3000 " " " "
2 " " " " " " ..... 6000 " " " "
1½ " " " " " excess over 10000 " " " "

Determination of Demand.

See 2 R. R. 180-181.

Discounts—Prompt Payment.

Five per cent of the first $25.00.
One per cent of excess over $25.00.
When bills are paid on, or before, ten days after their respective dates.

Additional Long Term Discount.

Contract for 3 years or more.

2 per cent during the 2nd year on current monthly bills
plus 2 per cent on bills paid during the first year.
5 per cent during the 3rd year on current monthly bills
plus 3 per cent on bills paid during the first and 2nd years.
5 per cent during the 4th and each succeeding year on current monthly bills.

Maximum Charge for Lighting.

The maximum rate of charge under any one month shall not exceed

10 cents per kilowatt-hour for first ..... 200 kilowatt-hours per month.
8 " " " " " next ..... 200 " " " "
6 " " " " " " ..... 200 " " " "
4 " " " " " excess over 600 " " " "

Minimum Charge.

At the rate of $1.00 per month.

Lamp Renewals.

The rates given above include the renewal of all standard incandescent lamps. Where consumer furnishes renewals, ½ cent reduction is allowed. (First installation must be purchased from the Company.)

Standard Riders.

None given.

Term of Contract.

Contract continues for one year or more.

Terms and Conditions.

See 2 R. R. 180-183.

POWER RATE

Optional for all consumers using the Company's standard service.

Rate.

6	cents	per	kilowatt-hour	for	first	.....	200	kilowatt-hours	per	month.
5	"	"	"	"	next	.....	200	"	"	"	"
4	"	"	"	"	"	.....	200	"	"	"	"
3	"	"	"	"	excess over		600	"	"	"	"

Discounts, etc.

Same as in Lighting Rate.

Minimum Charge.

At the rate of

$1.50 per month for installations of 2 horse power (rated capacity), or less.
$0.75 per month for each additional horse power (or $1.00 per kilowatt).

62—Character of Service

Service under the above rate shall be furnished under one of three classes.

(A) Electric Lighting: This service will include electric energy furnished for lamps and other appliances utilized for illumination purposes, except as hereinafter specifically exempted; motors and appliances other than lighting equipment, where provided with a starting apparatus designed to limit the initial or starting current to a value not exceeding $2\frac{1}{2}$ times the full load current, alternating current motors of $\frac{1}{4}$ h. p. when wound for 110 volts, and $\frac{1}{2}$ h. p. when wound for 220 volts; and direct current motors of 1 h. p. rated capacity, the aggregate rated capacity of such appliances not to exceed 2 kilowatts, will be included in this class when used in connection with lighting equipment, and when the connected load of such motors and appliances does not exceed the aggregate rated capacity of lighting equipment.

(B) Power: This service will include energy utilized for motive and heating purposes and miscellaneous lighting service, where the demand arising from such miscellaneous lighting service shall not be in excess of 20 per cent of the total simultaneous demand for lighting and power service. Stereopticons, moving picture machines, photographers' arc lamps, and rectifiers shall be classed as power equipment.

(C) Combined Lighting and Power Service: This service will include electric energy specified as "Lighting" (A), and electric energy specified as "Power" (B), where such combination service is supplied through the same meter.

42—Measurement of Demand

The demand is defined as the greatest rate at which electrical energy is used by the customer within any period of fifteen consecutive minutes, during the contract year, subject to the methods of determining demand hereinafter specified.

Assessed Demand

For installations of 2 kilowatts connected or less, the demand shall be assessed as follows:

For lighting installations of 2 kilowatts connected or less,

100 per cent of the first 300 watts connected, plus
66⅔ per cent of the connected load in addition to the first 300 watts, shall be deemed the demand.

For power installations of 2 kilowatts or less,

75 per cent of the total connected load, as indicated by the manufacturers' rating, shall be deemed the demand.

Where the demand is assessed, all sockets not containing lamps, shall either be removed, or sealed, by the Company.

Lighting consumers having installations of 2 kilowatts or less, shall purchase service providing for free lamp renewals.

Measured Demand

For installations of over 2 kilowatts, the demand shall be measured by permanently installed demand meters, or by monthly readings taken during the normal peak demand of the service. Such readings may be ascertained at the option of the Company, by counting revolutions of the wattmeter disc, or by printing quarterly hour readings of wattmeter, or by graphic recording wattmeter, or by the so-called Wright demand meter.

The maximum demand upon which the charge for power service (see B) is based, shall be the maximum obtaining during November, December, January and February, provided that such amount shall not be less than 75 per cent of the demand obtaining during any other month during the contract year.

The demand as measured shall be clearly indicated upon the monthly bill, and all memoranda relating to the original reading be filed, and become part of the consumer's record.

Temporarily Assessed Demand where Actual Demand cannot be Determined at Time of Commencement of Service.

Where the customer is connected for service during a month during which the maximum measured demand shall be less than the probable demand obtaining during November, December, January or February, the demand will be assessed in accordance with the following rules, and such assessed demand will be corrected as soon as the actual demand for the year has been measured, and the difference in the demand rate billed upon the assessed or estimated demand, and the demand rate based upon the actual or measured demand, shall be credited to the consumer, or paid by the consumer, as the case may be.

(1) In Class "1" customers (lighting service) the assessed demand shall be determined as follows:

100 per cent of the first..... 300 watts connected.
66⅔ per cent of the next.....1700 watts connected.
55 per cent for excess over the first.2000 watts.

Class 1 customers shall include all lighting customers except those designated as Class 2.

(2) In Class "2" customers (lighting service) the assessed demand shall be determined as follows:

100 per cent of the first..... 300 watts connected.
66⅔ per cent of the next.....1700 watts connected.
40 per cent for excess over the first.2000 watts.

Class 2 customers shall consist of federal and county buildings, churches and missions, hotels and clubs, factories (including small industrial establishments such as machine shops, carpenter shops, blacksmith shops, tin shops, and cigar factories, closing not later than 6 p. m.), private and parochial schools, grain and tobacco elevators and warehouses, freight and storage warehouses, stables and garages, both private, boarding and livery, and furniture stores occupying two or more floors above street level.

(3) In Class "3" (power service) the assessed demand shall be determined as a percentage of the total connected load as indicated by the manufacturers' rating:

75 per cent where installations are under 10 horse power.
65 per cent where installations are over 10 horse power and less than 50 horse power.
55 per cent where installations are over 50 horse power.

625—Feature Rates

Limited or Off-Peak Service. The foregoing rates for "Lighting Service" (see A), "Power Service" (see B), and "Combined Lighting and Power Service" (see C), less one-half the demand charge, shall apply to customers contracting to utilize, and utilizing, the service, at times during the calendar day other than during the hours of the month, specified as follows:

Month	Hours during which service shall not be used.
October	5:30 p. m. to 7:00 p. m.
November	5:00 p. m. to 7:00 p. m.
December	4:30 p. m. to 7:00 p. m.
January	4:40 p. m. to 7:00 p. m.
February	5:20 p. m. to 7:00 p. m.
March	6:00 p. m. to 7:00 p. m.

Customer shall install and maintain in operating condition, an automatic time switch of the type approved by the Company.

Ten-Seven Service. The foregoing rates for "Power Service" (see B), less three-fourths of the demand charge, shall apply to all customers contracting to utilize, and utilizing, the Company's service, only during the hours 10:00 p. m. to the following 7:00 a. m. Customer shall install and maintain in operating condition, an automatic time switch of the type approved by the Company.

Break-Down Service. The foregoing rates for "Lighting and Power Service" (see C), under both unlimited and limited or off-peak service, shall be furnished for break-down or emergency service connections. Since for such service the actual demand is unknown, customers shall contract for any demand, and shall be limited to the demand as contracted for, by an automatic circuit breaker, installed and maintained by the customer, and approved and controlled by the Company. It shall be set to open when the demand exceeds 125 per cent of the kilowatt ampere demand contracted for.

CURRENT RATE REFERENCES

619—Rate Differentials—Minimum Charge.

Portland Rate Ordinance Sustained, Journal of Electricity, Power and Gas, Dec. 7, 1912, p. 509.

Application of the Portland Railway, Light and Power Company for an injunction, to set aside an ordinance of the City of Portland, fixing minimum charge. Decision of United States District Court denying the application.

The ordinance complained of, arbitrarily reduces the minimum charge from $1 to 50 cents, per month. Judge Bean, in his decision, says, that there being no diversity of citizenship, the Federal Court is without jurisdiction on that ground, and the averments of the complaint do not support the contention of confiscation, and impairment of the obligations of contract.

481—Moonlight Schedule.

Street Lighting Tables, Electrical World, Dec. 7, 1912, p. 1185, and Supplement.

These three sets of tables, give hours for lighting and extinguishing street lights, for each month of 1913, so as to yield a yearly operation of about 3,830 hours, 2,000 hours, and 3,000 hours, respectively.

COURT DECISIONS

27—Appeal from Commission's Order.

Suit by Public Service Commission (New York, 2nd District) et al, v. Westchester Street Railroad Company, to enforce an order of a maximum five-cent fare. Decision of the Court of Appeals of New York, Oct. 1, 1912, affirming the order. 99 Northeastern Reporter, 536.

> There is no doubt, that the rate of fare to be charged, to and from points in the village, was a matter of such municipal and public interest, that the municipal authorities might bargain with reference thereto. Therefore the grant of the new franchise, on the condition and consideration, amongst others, of a five-cent fare, between the points now involved, and the acceptance by the company thereof, and its agreement to observe all the "conditions, regulations and restrictions" thereof, made a valid contract. . . .
>
> The only substantial objection to the present proceeding, is that it appears, that the appellant cannot carry passengers between the points in question for five cents, and that therefore this application should be denied as a matter of equity. . . .
>
> I am not aware of any principle or authority which compelled the court to refuse to enforce the obligations, imposed by the contract involved, simply because one of the parties had ill-advisedly agreed to unprofitable terms.
>
> There may be considerable force in the appellant's argument that sound public policy is not best subserved by compelling a public service corporation to furnish service at a loss. But even if that be the fact, here we see no opportunity to give relief from it in this proceeding.

122—Just and Reasonable Charges—Discrimination.

Suit by Peoples Telephone Company v. Lewis, to recover for telephone service at full rates. Decision of Supreme Court of Wisconsin, October 29, 1912, sanctioning a special contract. 138 Northwestern Reporter, 100.

> The case presents the question, of whether a mere special contract, with a public utility corporation for services, made prior to the [effective date of the public utility law] . . . an ordinary agreement for service, recognized as valid, and expressly given validity by such section [1797m 91 (Laws 1907, 499)], can be relied on by one party thereto, as binding on the other seeking to repudiate it. No reason is perceived why the answer should not be in the affirmative as it was below.

14—Relations of Corporations with Each Other

Telephone Merger Upheld. Suit by the City and County of San Francisco, to set aside the sale of the Home Telephone Company to the Pacific Telephone and Telegraph Company. Decision of the Supreme Court of California, sustaining the sale. Electrical Review, Dec. 7, 1912, p. 1080.

This decision reverses that of the Circuit Court of Kentucky, mentioned in 2 R. R. 172, on the same question. The suit was on the ground of a provision in the franchise granted to the Home Telephone Company, forbidding it to sell or transfer its property. Judge Ellison holds that this provision is null, and says:

> I find nothing in the provisions of the charter of the city and county of San Francisco, that either expressly, or by inference, confers upon the city the power to place in the franchise, the provision that the grantee thereof should not sell or dispose of its property. No law of the State conferred such power and the condition is clearly against the policy of the State.

CURRENT REFERENCES

3—Economic and Financial.

The Public and Public Service Corporations, by F. K. Blue, Journal of Electricity, Power and Gas, 1⅓ pages, Nov. 30, 1912, p. 483.

States principles of regulation necessary to make rates of public utilities correspond with those established under normal competition, and so avoid, for the companies and the public, the uneconomical conditions of competition.

Rate Fixing and Appraisal: Automatically Directed Method of Rate Fixing and Price Control, by F. K. Blue. Journal of Electricity, Power and Gas, 2 pages. Dec. 7, 1912, p. 500.

Gives in more detail, the plan suggested in his article in the preceding number of the Journal, for automatically adjusting rates, so that they will follow the cost of production, and similarly controlling the price of stock to conform to the actual value of the property.

31—Valuation

Valuation of Public Service Properties, by L. R. Nash, 20 pages. This paper, which is reprinted from Stone and Webster Public Service Journal for October, 1912, summarizes opinions, decisions and methods bearing on the various important factors in the problem of appraisal, and outlines some uses which are made of valuation figures.

31—Valuation

Valuation of Land for Rate Making Purposes, editorial, Electrical Review, 1 page, Dec. 14, 1912, p. 1106.

Discusses depreciation and appreciation of land as factors of the value of a property, and suggests the view that cost of reproduction does not seem so equitable as original cost for this item.

222—Uniform Accounts—New Jersey

Uniform System of Accounts Approved in New Jersey, Electric Railway Journal, Dec. 14, 1912, p. 1205.

The Board of Public Utility Commissioners of New Jersey, has approved the uniform systems of accounts, mentioned in 2 R. R. 98, and also has sent out the proper notifications that "every municipality operating any form of public utility service, shall keep the accounts thereof, in the manner prescribed by the board for the accounting of similar public utilities."

2—Public Service Regulation—Maryland

Supplemental Brief by Albert C. Ritchie, People's Advocate, filed with the Maryland Public Service Commission, in the complaint as to the reasonableness of gas and electric rates, of the Consolidated Gas, Electric Light and Power Company of Baltimore. Electrical World, ½-page, Dec. 14, 1912. p. 1254.

Mr. Ritchie's principal attack is directed toward the gas and electric consolidation of 1905 and 1906, which, he states, made no change whatever in ownership, and resulted in capital inflation of many millions of dollars. He submits a copy of the report of the St. Louis Public Service Commission to the Municipal Assembly of St. Louis, upon the United Railways Company of that city, showing over-capitalization, and quotes extensively from the report, the language of which, in reference to over-capitalization, he claims is absolutely applicable to the Baltimore case.

112—Franchises.

Report on Legal and Franchise Matters, Charter Amendments, to the Board of Supervisors, San Francisco, Nov. 5, 1912, by Bion J. Arnold, 28 pages.

This is Part 1 of the Preliminary Report No. 13, and gives a brief, clear, and interesting summary of the traction situation in San Francisco, of the transportation difficulties to be met, and of practical measures to be taken to secure the three great objects,

I. Adequate service;

II. The protection of actual investment, whether municipal or corporate; and

III. The highest rate of wages consistent with the limitations of a five-cent fare, and the proper maintenance and renewal of the property.

Supplementary to these are:

(a) The method of regulating the utility.

(b) The method of decapitalizing obsolete investment and intangible values.

(c) The determining of the question of whether the investment shall be a continuing one or be decapitalized to extinction; and if the latter, the fixing of the period long enough to make it practicable under a five-cent fare.

An abstract of this report with an editorial comment, is given in the Electric Railway Journal, 3½ pages, Dec. 7, 1912, p. 1136 and p. 1150.

31—Valuation

Two Conflicting Theories of Valuation of Public Service Companies, by Halbert P. Gillette. Engineering and Contracting, 1½ pages. Dec. 11, 1912, p. 648.

Deals with appraisals made only for the purpose of fixing rates, and states that much of the diversity of opinion as to the value of public utility properties, is due to two different ways of regarding them, first the competitive theory, which prevailed in the past, and assumed that the rates would be regulated by the law of supply and demand acting through competition, when the proper value of a utility means only what it will earn, or its capitalized present net earnings, plus, or minus, the present worth of any increment, or loss, in future annual net earnings; and second the agency theory, now being developed, and used almost exclusively by Commissions and Courts in rate cases, every public service company being regarded as an agent of the public delegated to perform certain services, and to collect payment therefor, when the proper value is the actual cost of the property from the beginning, including the accumulated deficits in fair return—the development cost.

31—Valuation.

Essential Points Governing the Financial Value of an Engineering Property, by Schuyler R. Schaff. The Richardson Press, New York, 1912. 87 pages. $1.00.

Gives practical information of many considerations and comparisons necessary, in the engineering work of laying out plants of various utilities, as hydraulic power systems, or surveying for railroads, to secure the greatest economy of construction, considering both original cost, and cost of maintenance.

Report of the Committee on Railroad Taxes, and Plans for Ascertaining Fair Valuation of Railroad Property, of the National Association of Railway Commissioners, 59 pages.

Public Service Regulation for December will contain an extended report of the convention of the National Association of Railway Commissioners, including this report, mentioned in 2 R. R. 139.

315—Intangibles—Going Value.

Rate Investigation, Chicago Telephone Company—Notes on Going Value, prepared by N. T. Guernsey, Special Counsel American Telephone and Telegraph Company, Dec. 4, 1912. 7 pages.

This is a compilation of court decisions on Going Value, given in connection with the provisions of the ordinance of the Chicago City Council, to show that Professor Bemis' exclusion of this item, in his late report on the Chicago Telephone Company, is not sustained by the best opinions.

39—General Economic and Financial Information.

Summary of Revenues and Expenses of Steam Roads in the United States, for the month of September, 1912. Bulletin No. 41, Prepared by Bureau of Railway Economies, of Railway Companies of the United States, Washington, D. C.

This is a condensed statement of railroad returns, with tables and diagrams, comparisons with those of September, 1911, and for the first nine months of 1912, with corresponding months of 1911.

51—Cost of Service

The Reduction in the Cost of Electric Lighting Abroad, Engineering News, Dec. 12, 1912, p. 1091.

Gives a diagram and interesting figures of the annual costs for lighting a four-room Berlin dwelling from 1896 to 1912.

2—Public Service Regulation

The Federal Water-Power Policy, by M. O. Leighton, and editorial, Engineering News, 4½ pages, Dec. 12, 1912, p. 1088, and p.1108.

Outlines the growth of present regulations of water-power privileges, giving the basis, legal foundations, and need for regulation, and summarizes a new set of regulations adopted by the Secretary of the Interior a few weeks since, to overcome the objections of investors to a revocable permit, which grants no easement to any lands, and leaves the water-power owner subject to dispossession, if his structures are on land subsequently included in a mineral servey.

741—Inspection of Premises.

Wiring Rules in Various Cities, Electrical Record, 1 page, December, 1912, p. 28.

This is a tabulation of the practice in regulating electric wiring, in cities of the United States. Of 54 cities, 36 use the National Electrical Code; 5 have codes based on the National Electric; and 10 have no regulations at all.

81—Municipal Regulation of Utilities.

Rate Fixing and Appraisal: State Control Versus Municipal, by William J. Hagenah, Journal of Electricity, Power and Gas, 2 pages, Dec. 7, 1912, p. 502.

States concisely the practical reasons why municipal regulation of public utilities is inefficient and unsatisfactory, as well as uneconomic. There is a growing demand for such state-wide regulation of all public service corporations, by a single commission properly authorized by law, and provided with facilities for the investigation and determination of all questions affecting these corporations, as has proved successful in Massachusetts, New York and Wisconsin.

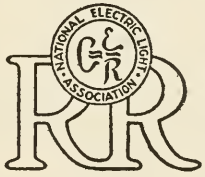
97—Public Relations.

Obligations of Public Service Corporations, by Charles M. Cohn, Electrical Review, ½ page, Dec. 7, 1912, p. 1060, and Public Relations, by Harold Almert, 2⅔ pages, p. 1068, and editorial, p. 1059.

These all show the importance to public utility companies, of establishing right relations with the public, as, when misunderstandings and controversies arise, it is sometimes difficult to obtain fair dealing from public service commissions, some of which are as yet inexperienced, when public opinion has been turned against the utilities.

Vol. 2 December 25, 1912 No. 13

RATE RESEARCH



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Rate Research

Vol. 2. CHICAGO, DECEMBER 25, 1912 No. 13

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATE REFERENCES

69—Rate Schedules—Hartford, Connecticut.

In 2 R. R. 159, the Committee discussed the various types of general lighting rates, and stated that some of the companies have adopted other rates as corollaries to this general rate.

It is very important for the industry that the right of the central stations to classify in this way, should be generally recognized, even although some companies feel that only the few basic rates are necessary. Each locality should be free to work out the development necessary to meet its own local conditions.

The new schedule of the Hartford Electric Light Company of Connecticut, effective December 1st, 1912, is an excellent example of such practice. They have a residence rate that is not available for business purposes, a cooking rate not available for power, and a power rate not available for cooking.

Below is given their residence lighting rate, arranged in accordance with the recommendations of the Rate Research Committee, and directly under it, the residence lighting rate as it appears in their schedule for comparison. The balance of the rates are given as they appear in the schedule of the company.

RESIDENCE LIGHTING.

Available for all consumers using the company's standard service.

Rate.
9 cents per kilowatt hour.

Discounts—Prompt Payment.
5 per cent, when bills are paid on, or before, ten days after their respective dates.

Minimum Charge.
None.

Lamp Renewals.
The rate given above includes the renewal of standard metallized filament lamps, and Tungsten lamps of 250 watts and over, when burned out lamps are returned unbroken.

Standard Riders.
None given.

Term of Contract.
None given.

Terms and Conditions.
(See contract form.)

EDITORIAL NOTE.—All indented matter is direct quotation.

SCHEDULE A—RESIDENCE LIGHTING.

1—On Meter.

Current for residence lighting, will be furnished to customers signing contract embodying the Company's terms and conditions, at the rate of nine cents (9c) per kilowatt hour, less 5% for 10 days cash payment.

2—Flat Rate.

Customers may, at their option, sign a flat rate contract for not less than one year, for low voltage tungsten lighting under the following schedule:

10—10 c. p. lamps—$1.00 per month. Each additional 10 c. p. lamp, 6c per month. Less 5% for 10 days cash payment.

10—20 c. p. lamps—$1.50 per month. Each additional 20 c. p. lamp, 12c per month. Less 5% for 10 days cash payment.

SCHEDULE B—WHOLESALE LIGHTING.

1—On Meter.

Current for commercial lighting, will be furnished customers signing contract embodying Company's terms and conditions, according to the following schedule:

Monthly Consumption.

		Per k. w. hr.
For the first	500 k. w. hrs	$0.09
For any part of next	1000 " "	.07
" " " " "	2500 " "	.04
" " " " "	6000 " "	.035
For all excess		.025

Under this contract, the following discounts from the gross bill, for long burning hours will be allowed:

35% for over 350 hrs. use of installed load per month.
30% " " 280 " " " " "
25% " " 230 " " " " "
20% " " 195 " " " " "
15% " " 165 " " " " "
10% " " 140 " " " " "
5% " " 115 " " " " "
2% " " 100 " " " " "

A further discount of 5% for 10 days cash payment will also be allowed.

Flat Rate.

Flat Rate Contract, based upon meter schedule and subject to revision at the expiration of one year, will be given to customers desiring to contract for a definite number of hours' use of installed load. This rate will include lamp renewals up to a normal amount, for the contracted hours of burning.

SCHEDULE C—POWER.

Current for wholesale power purposes, will be furnished to regular users of power upon signing contract embodying the Company's terms and conditions according to the following schedule:

Monthly Consumption.

		Per kilowatt hour
For the first	500 kilowatt hours	$0.045
For any part of next	1000 " "	.035
" " " " "	3500 " "	.0275
" " " " "	65000 " "	.015
For all excess		.013

These rates are for power only. Energy used directly or indirectly for lighting purposes, must be metered separately, and billed at lighting rates, except that for any month when the energy used for power, exceeds 90% of the total, the amount of energy used for lighting, will be included with that for power, and the total billed at power rates.

SCHEDULE D—NIGHT POWER.

Current used for power at night.

In order to encourage the use of power at night, any customer contracting for energy under either the Power or Cooking schedule, upon a guarantee of a minimum payment of $20.00 per month, for their night power, will be allowed a discount of 40% on such a fraction of their total power, as is used between the hours of 10 p. m., and 7 a. m.

The Company will install special meters for recording this power, without charge, provided the demand for such Night Power amounts to at least 10% of the total.

SCHEDULE E—COOKING.

The Company will furnish energy for operating Cooking and Heating Apparatus, to customers signing contract embodying the Company's terms and conditions at the rate of 3c per kilowatt-hour, on a guaranteed minimum payment of one dollar ($1.00) per month. This schedule may be used in residences to include such other household appliances as flat-irons, cleaners, etc., as may be desired, in addition to the Cooking Apparatus contracted for.

SCHEDULE F—AUXILIARY SERVICE.

The Company will maintain a service for supplying electric current as a reserve, auxiliary, or breakdown to a private generating plant, provided the customer guarantees a minimum monthly payment for this service of:

$3.00	per kilowatt	per month	for the first	25	kilowatts	contracted	for.
2.00	"	"	" next	75	"	"	"
1.50	"	"	" "	100	"	"	"

Current will be delivered at customer's switchboard, and billed monthly, according to regular light or power schedules, subject to above minimum monthly payments.

No lamp renewals are supplied under this schedule.

SCHEDULE G—SPECIAL APPLICATIONS.

In order to encourage novel uses of electric current, the Company is prepared to investigate any proposed installations, and to quote low experimental rates thereon, subject to revision at the expiration of one year's contract.

619—Rate Differentials—Discounts.

In the Appropriation Act to provide for the government expenses of the District of Columbia, is found in the following provision,

> That if consumers other than the Government shall not pay monthly electric bills within ten days after the same shall have been presented, said companies may charge and collect from said consumer so failing to pay said bills as aforesaid, eleven cents per kilo-watt hour for the electric current furnished to said consumer during said month.

PUBLIC SERVICE REGULATION

COMMISSION DECISIONS—NEW YORK

129—**Default in Public Service—Discrimination.**

Complaint against the New York Edison Company alleging discrimination. Decision of Public Service Commission (1st D., N. Y.), declaring certain contracts illegal.

While the text of the decision has not yet been received, the Commission has announced the following decision:

The Edison Company supplied electricity to Gimbel Brothers' department store under two contracts, one for furnishing electric current, in excess of a certain amount annually, for 3 cents per kilowatt-hour, and the other for rental of space in the basement of the department store for a sub-station, agreeing to pay therefor the difference between 2¼ cents per kilowatt-hour and the price named for electricity in the first contract. A similar contract was in force with the Broadway Realty Co. The Commission holds that the Edison Company should have contracted to pay the market value of the space rented, leaving the customer to pay the lawful rate for the current consumed, i. e., the rate paid by every other consumer of the same class.

COMMISSION DECISIONS—CALIFORNIA

14—**Relations of Corporations with Each Other—Consolidation.**

Application of Coast Valleys Gas and Electric Company, and King City Water, Light and Power Company, to sell all of the property of the latter, to the former company. Granted Oct. 28, 1912.

Commissioner Eshleman says:

> Under ordinary circumstances, it is desirable, where one utility owns all of the stock of another, that the ownership of the property should also be acquired, by the utility owning the stock, and thus avoid unnecessary duplication, in the management of the property. There may be cases where the Commission would not permit a sale of the property, even where the company desiring to purchase, owned all the stock of the company desiring to sell. If the company desiring to purchase, should be in a bad condition financially, and the sale would extend the lien of the bonded indebtedness, of the company desiring to buy, over the property to be purchased, as would ordinarily be the case, it might be inadvisable to permit the formal transfer of the property.

33—**Capitalization.**

Application of The Central California Gas Company (Porterville, pop. 2696, exeter. 600, Lindsay, 1814), for an Order Authorizing the Issuance of Bonds and Preferred Stock. Granted October 3, 1912. Commissioner Thelen writes the decision and says:

> I deem it wise to call attention at this time to the result of the action which I recommend be taken in this case. While the holder of preferred stock occupies no different relation to the public, than does the holder of common stock, yet the buyer of such stock purporting to bear interest at a certain rate, expects that the interest will be paid. When this Commission authorizes the issuance of bonds at 6 per cent, and preferred at 6 per cent, in an aggregate sum in excess of the value of the property to be acquired from the proceeds thereof, and thereafter fixes rates on the fair value of the property devoted to the public service, it may follow that the purchaser of the preferred stock can not receive from the legitimate income, which is the result of reasonable rates, the interest which his preferred stock specifies.
>
> Heretofore this Commission has only allowed issues of bonds against property in an amount substantially less than the value of the property. The difference necessary to be added in order to produce the property, should ordinarily be raised from the sale of common stock, the holders of which have no promise, implied or otherwise, that they will participate in any amount of dividends. Notwithstanding these facts, I have advised the granting of this application and of Applications Nos. 213 and 216, and the issuance of bonds and preferred stock of a par value greater in amount than the value of the property to be produced from the proceeds thereof. I am convinced that this action is justified under the peculiar circumstances of this case, and the opinions and orders on these applications should not be used as a precedent for other cases. This company was one of those, which was formed before the effective date of the Public Utilities Act. It had already issued its common stock, and had taken certain other steps toward the promotion of its enterprise, before the jurisdiction of this Commission attached. Heretofore, in dealing with its financial affairs, we have imposed certain conditions, with a view to the ultimate consummation of the objects for which the company was formed, but have been more lenient in this regard, than we would be if the enterprise were one which had its inception after the passage of the Public Utilities Act.
>
> Considering that a wise exercise of discretion by this Commission, would lead it to foster, and not hamper, the enterprises that had been organized under other conditions than those that now prevail, I believe that the present securities which we are authorizing, will be of benefit to this corporation, and to its present and pro-

spective consumers. I believe, however, that the stockholders should be aware of the condition, and that this utility should be warned that, in the future, the Commission will expect it to secure the funds necessary to supplement a bond issue, from sources other than preferred stock.

132— PROTECTION FROM COMPETITION

The opinions cited on competition in public utilities, in the decision of the Wisconsin Railroad Commission in the Milwaukee electric rates case, abstracted in 2 R. R. 175, suggested the further compilation of the following expressions by authorities on this important subject.

MASSACHUSETTS BOARD OF GAS AND ELECTRIC LIGHT COMMISSIONERS

The evidence as presented to the board seems to afford no reasonable ground for the expectation that the proposed company could afford its lights for less than the existing company. . . . It does not possess and probably does not expect to acquire the exclusive control of any invention by which special saving in cost may be effected, and it cannot reasonably be expected to possess any higher technical or business talent than lies within the reach of the existing company.

It is the duty of the board and its only purpose to secure to the people of Worcester, so far as it lies within its power, the best service at the lowest reasonable price. There is some reason to believe that the admission of the proposed company might seriously impede, perhaps wholly defeat, this object. It must be recognized that both companies are to be promoted and to be conducted for the sake of profit, and that they will be governed by the same laws as other companies in similar business. . . . The history of corporations doing an electric lighting and similar business in competition in various parts of the country affords strong ground for believing that a new company, if allowed to engage in business, would not long remain by itself, as competition for a period would probably be followed, as elsewhere, by consolidation or absorption. . . . But combinations, and consolidations, as is well known, afford the opportunity and usually a temptation to stock development too great to be resisted. Such needless outlay should be avoided and saved, for when it has once been incurred, or the money expended in an enterprise not required to supply the public wants, so great is the expectation of gain, and so persistent and unyielding the demands of capital for dividends, the remedy is not then easily found or applied, and the better policy avoids the evil at the outset by preventing the expenditure. . . .

If to sustain this appeal shall seem to secure to the existing company a monopoly of the business, it must be remembered that it can only retain this as long as the public interest is best served thereby, and that such monopoly is conditional and restricted. The company claims and exercises a general franchise throughout the city. It may be compelled to meet all reasonable demands. If it unreasonably fails or neglects to supply light when requested, this board has power to compel such supply and has frequently exercised this authority in other localities. Consumers have a right to the lowest remunerative rates, and if they believe the prices charged are too high they can petition for a reduction, and the order of the board as to price is binding upon the company. While the interests of the shareholders, present or prospective, ought not to be overlooked, the convenience, comfort and pecuniary benefit to the community are surely of the first importance.

Worcester El. Lt. Co.....Mass. G. & E. R., 1894, 23-26

A like result would probably follow a similar experiment. The board believes that the Legislature intended, by the recent acts, that all the reasonable and permanent advantages of competition are to be gained through the regulating powers thereby conferred upon it. The statutes assume that cities and towns, as well as private citizens, are entitled to light at reasonable prices. The only avowed object in granting the franchise appealed from was to secure a reduction in rates. The mayor alone, or twenty customers, if the price is thought too high, may bring petition before the board, asking that the price be reduced. This remedy ought to be invoked, if the existing company has suitable equipment and is well managed, before the community is subjected to the danger and inconvenience of a second system of poles and wires. Any lack of apparatus, or waste in the methods of business, any unnecessary cost of power,—indeed, everything relating to the economy and quality of the work of a company are rightfully taken into account in fixing the price.

The board therefore sustained the appeal, and revoked the permission granted by the mayor and aldermen.

Northampton El. Lt. Co.....Mass. G. & E. R., 1892, 21-22

And the following additional cases covering the same point:

Chelsea Gas Lt. Co.....Mass. G. & E. R., 1891, 17
Chelsea Gas Lt. Co.....Mass. G. & E. R., 1895, 8
Boston Ed. Ill. Co.....Mass. G. & E. R., 1895, 17
Gt. Barrington El. Lt. Co.....Mass. G. & E. R., 1895, 19
Rockport El Lt., P. & Ht. Co.....Mass. G. & E. R., 1896, 8
Easthampton Gas Co.....Mass. G. & E. R., 1908, 32
Fitchburg G. & El. Lt. Co.....Mass. G. & E. R., 1910, 50
Newton Gas Co.....Mass. G. & E. R., 1889, 77
Boston Ed. El. Ill. Co.....Mass. G. & E. R., 1895, 14

Stoneham Citizens Gas Lt. Co.....Mass G. & E. R., 1890, 91-92
Clinton Gas Lt. Co.....Mass. G. & E. R., 1890, 93
Roxbury El. Lt. Co.....Mass. G. & E. R., 1890, 98
Dedham & Hyde Park G. & E. Co.....Mass. G. & E. R., 1890, 102
Middleborough El. Lt. & P. Co.....Mass. G. & E. R., 1890, 104
Marlboro El. Co.....Mass. G. & E. R., 1893, 14
Haverhill El. Co.....Mass. G. & E. R., 1908, 20
Worcester El. Lt. Co. [2nd appl.].....Mass. G. & E. R., 1910, 55

MASSACHUSETTS SUPREME COURT

The fundamental principles, relied on by the petitioner as applicable to corporations of this general class, are well established. But the laws of this commonwealth in regard to gas and electric lighting companies and the facts of this case give rise to considerations very different from those which induced the decisions in many of the cases above cited. In the first place, in reference to this department of public service, we have adopted in this state, legislative regulation and control as our reliance against the evil effects of monopoly, rather than competitive action between two or more corporations, where such competition will greatly increase the aggregate cost of supplying the needs of the public, and perhaps cause other serious inconveniences. The state, through the regularly constituted authorities, has taken complete control of these corporations, so far as is necessary to prevent the abuses of monopoly. Our statutes are founded on the assumption that, to have two or more competing companies running lines of gas pipe and conduits for electric wires through the same street would often greatly increase the necessary cost of furnishing light, as well as cause great inconvenience to the public and to individuals from the unnecessary digging up of streets from time to time, and the interference with pavements, street railway tracks, water pipes and other structures.
Weld v. G. & El. Lt. Commissions, 1908....197 Mass. 556, 558-559

NEW YORK PUBLIC SERVICE COMMISSIONS

The whole electric history of New York City points the futility of competition. In the early years of the industry numerous companies were organized. From time to time they were absorbed, only to be followed by new companies frequently encouraged by the city with the idea that competition was the life of trade, and that the more competition there was the better would be conditions. But the same procedure occurred again and again. The new companies were merged or swallowed up, until at the present time there are but two electric supply companies operating in Manhattan, and these two companies, although nominally independent, are owned and controlled by the Consolidated Gas Company. p. 249.

In the first place, the existence of competing companies necessitates constant opening of the streets to provide service connections to the houses and street mains for the distributing wires. p. 250.

Competition also involves duplication of generating plants and substations. Each company must provide sufficient plant not merely to supply the peak of the load, but to meet any accident which may occur. Machinery must at all times be held in reserve, and when there are several independent companies, no one of which may take a momentary advantage of the reserve of the other, they all must maintain reserves very much in excess of what one company must keep, where it may fall back upon any and all of its stations to meet a failure at one of them. Again, it is well known that one company can generate current for the whole of Manhattan much more cheaply than can several companies, each one of which undertakes to supply the entire borough. Further, the loss due to distribution is larger where there are several systems. p. 251.

The result of such duplication of capital and the less economical methods of production and distribution is, that the cost of delivering current to the consumer is larger under competition than under efficient monopoly. It may be, and often has been, true that competition has temporarily lowered rates and improved service, but this does not controvert the statement that the cost to one company of current is less than the cost to several. Competition has forced price nearer to, or below, cost for the moment, but everyone knows that when the rate war has ceased, due to agreement or merger, prices have gone up, and the consumer ultimately has paid the bill, and has continued to pay interest and dividends upon duplicate capital unless the state has stepped in. p. 251.

The applicant has not proved that the existing companies are not properly conserving the public interest and convenience, and that it would be to the advantage of the community to have a new company authorized to enter the field. p. 253.

If a competing company were allowed to begin operation, it is not likely that it would continue to operate independently for any considerable period. p. 254.

In re Appl. Long Acre El. Lt. & P. Co. . . . . 1 P. S. C. (1st D., N. Y.) 226, 247.

And the following additional cases giving similar decisions:
In re Appl. Lockport Lt., Ht. & P. Co. . . 1 P. S. C. (2nd D., N. Y.) 12
In re Appl. Kotonah Lighting Co. . . . . 1 P. S. C. (2nd D, N. Y.) 46
In re Bath Citizens El. Service Co. . . . 1 P. S. C. (2nd D., N. Y.) 336
In re Appl. Buf., Roch. & East. Ry. Co. . 1 P. S. C. (2nd D., N. Y.) 532

The New York Supreme Court has recognized the same theory. It is the settled policy of the state to discourage competition of this character, and the reasons for the adoption of this policy have been clearly stated by the Court of Appeals (People ex rel. N. Y. Electric Lines Co. v. Ellison, 1907, 188 N. Y., 523). By sec. 11 of the Gas and Electric Commission Act of 1905 (ch. 737 of the Laws of 1905) it was provided that no corporation for the manufacture and supply of gas should exercise its power without first obtaining a certificate of authority from the commission, and the commission was authorized to withhold its certificate 'if the territory within which such corporation proposes to operate is already supplied by an ample and well constructed system, furnishing the service which such corporation proposes to furnish at a fair and reasonable rate,' and while the act containing this provision has been superseded and repealed by the Public Service Commissions Law (ch. 429, Laws of 1907), that act continued the prohibition of the exercise of its powers by any gas or electrical corporation until it shall first have obtained the permission and approval of the proper commission provided for by the act. . . .

As has already been shown, the power which the state retains and has exercised to fix a reasonable price upon the commodity, and to compel its delivery to any person desiring to purchase it, removes any danger of the especial vice which attaches to monopolies in other articles in common use, and, as has also been shown, the consolidation of control brought about by the purchases of stock complained of does not in any proper sense create such a monopoly as the common law and our statutes condemn.

In re Attorney General, 1908.....124 App. Div. (N. Y.) 401, 405-408

WISCONSIN RAILROAD COMMISSION

That practices of this kind under such competitive conditions as those which prevail in Milwaukee should lead not only to unjust and serious discriminations but to disastrous rate wars from which in the end only harm can come to the public, is obvious to all who have paid attention to such matters. Unjust personal discriminations are always injurious, not only to the person adversely affected but from the point of view of public interest. When carried far enough, or in their exaggerated form, they usually drive those, who are not favored, out of business and leave the favored persons in control of the situation. In the past such practices have often defeated the laws of competition. It has also, as a rule, led to questionable business practices in other respects. . . .

Rate wars usually mean, for a time at least, lower than paying rates, failure to keep the plant in good operating condition, and in the long run inadequate service. They often result in financial ruin to one or more of the plants involved, the crippling of the rest, and in the ultimate consolidation of the remnants of all into one concern. When peace has in this way been restored, it is often necessary, in order to secure adequate service, to advance the rates, not only to the level which prevailed before the contest, but to even higher figures. This has been the history of rate wars from their beginning, and there is nothing to indicate that this would not be the result in these cases. If the war was permitted to go on, such results could not even be entirely prevented by the Public Utilities Law, for the only way in which ruined plants can be made to furnish adequate service is through the investment of additional capital, and this can only be had at rates that are high enough for reasonable returns. In one way or another losses and destruction due to rate wars are in the end almost certain to have to be borne by the public. In the end the customers also will lose more through bad service and high rates than they gained through the temporary low rates which they enjoyed during the struggle. In the public utility field rate wars are so clearly against public policy that they should not be permitted under any circumstances. This is also recognized in the Public Utilities Law, for it is clearly in order to enable this Commission to prevent or stop such struggles that sec. 1797m-99 was included therein.

That competition in the very nature of things cannot be a proper regulator of rates and other conditions in the public utility field, would seem to be too well understood for discussion. As a real competition in this field means duplications of plants, which duplications, when once put in, are for the most part useless for any other purpose than that for which they were intended, and which duplication, unlike current capital, cannot be withdrawn from the service and used for other purposes. It also means excessive outlays for fixed and operating expenses. Again, it stands for unnecessary tearing up and occupation of already overcrowded streets and alleys, the possible duplication of services on customers' premises, and for many other inconveniences and costs.

In re Inv. Milwaukee E. Ry. & Lt. Co., etc. 1912..9 W. R. C .R. 553, 554, 556.

Duplications of such plants is a waste of capital, whenever the services can be adequately furnished by one plant only. It necessarily means that interest and maintenance must be earned on a much greater, if not twice as great, an investment, and that the actual cost of operation is likely to be relatively higher. Competition in this service therefore usually means a bitter struggle and low

rates, until one of the contestants is forced out of the field, when the rates are raised to the old level, if not above it, or to a combination or understanding of some sort between them which also ultimately results in higher rates. In this way it often happens that the means which were thought to be the preventative of onerous conditions become the very agents through which such conditions are imposed. In fact, active and continuous competition between public utility corporations, furnishing the same service to the same locality seems to be out of the question. This has been shown by experience. Such competition is also contrary to the very nature of things. Two distinct and separate corporations are not likely to remain separate very long after it becomes clear that the services rendered by both can be more cheaply and more effectively furnished by only one of them.

In re Appl. LaCrosse G. & El. 1907.....2 W. R. C. R. 3, 5

And the following other cases covering the same point.

Kenosha Electric Railway Co. 1911.....8 W. R. C. R. 119
In re Appl. Village of Cashton 1908.....2 W. R. C. R. 677, 690

Note—This compilation will be continued in next week's RATE RESEARCH.

CURRENT REFERENCES

112—Franchises.

FRANCHISES, a 43-page pamphlet, issued by the Department on Regulation, of the National Civic Federation, is the fifth to appear in its series of compilations of public utility regulation laws of the United States.

It classifies the subject under the three main headings
A. Certificates of convenience and necessity,
B. Relations between state commissions and municipalities,
C. Indeterminate franchises,
and gives the sections of legislation covering each.

2—Public Service Regulation.

IMPROVING COMPANY PRACTICE BEFORE COMMISSIONS, editorial, Electrical Review, Dec. 21, 1912.

States the importance to companies, in hearings before Commissions in applications for the issue of securities, and adjusting of rates, to present a full case, showing every essential item of its expenditures and practice, as a commission to perform its duty to the public, must be in a position to practically audit the expenditures it is asked to allow to be capitalized.

2—Public Service Regulation.

GOVERNMENT REGULATION, by SAMUEL O. DUNN, Public Service Regulation, 1½ pages, Nov., 1912, p. 709.

States that the organization a few years ago by the railroads of a Special Committee on the Relations of Railway Operation to Legislation, marks the beginning of a better policy on their part towards regulation, and will do much to put an end to unwise and unfair regulation such as has sometimes hampered railroads in the past, when their only action in this matter was to oppose all regulatory legislation, good or bad. The present Committee's method is to have "the railway side of every question presented fully to the labor brotherhoods, committees of Congress, the Interstate Commerce Commission, and the public, by railway officers who are experts on the particular subjects; to entirely oppose regulation only when it would deal with subjects outside the proper scope of regulation, and to co-operate in framing measures for the regulation of matters that are within the scope of helpful public control."

254—Experts

A GERMAN CODE OF FEES, article and editorial, Engineering News, 3 pages, Dec. 12, 1912, p. 1092, and p. 1107.

This paper is a translation of the present German code of fees adopted in 1901 by six technical associations of architects, and of civil, mechanical, electrical, heating and gas and water engineers. No standard method of charging for architectural and engineering work exists in the United States, but in Germany such codes have existed for thirty-five years.

31—Valuation.

ETHICAL AND ECONOMIC ELEMENTS IN PUBLIC SERVICE VALUATION, by JAMES E. ALLISON, Commissioner and Chief Engineer, Public Service Commission of St. Louis, Quarterly Journal of Economics, 23 pages, November, 1912, p. 27.

Describes the theories of Valuation, Original Cost, Continuous Property, Cost of Reproduction New, and Cost of Reduplicating the Service, in an able and scholarly manner.

> The need is for some guiding over-theory which will guard against ethical errors, and show where the different economic elements can safely be used or rejected. . . .
>
> The returns to be earned by the public utility companies should be so adjusted as to give a just reward for efficient sacrifice in the service of the public.

32—Depreciation.

DEPRECIATION, a paper by GEORGE C. SHAAD, and discussion by members, Official Convention Proceedings, Fifteenth Annual Meeting of the Kansas Gas, Water, Electric Light and Street Railway Association, 3 pages. October 17, 1912, p. 41, Manhattan, Kansas.

Defines depreciation, and straight line and sinking fund methods of determining it, the former having the advantage of simplicity, the latter including compound interest on the amount laid aside. States that the rate of depreciation can not be arbitrarily fixed, but must be governed by local conditions, inspection, etc. The discussion brings out some interesting points.

33—Capitalization.

Regulation of Stock and Bond Issues, a 58-page pamphlet, issued by the Department on Regulation, of the National Civic Federation, is the fourth to appear in its classified digest of public utility regulation laws of the United States.

This gives, arranged under twenty-one headings, the provisions of statutes in the various states, conferring powers on administrative commissions, to regulate stock and bond issues.

395—Proceedings of Technical Associations.

Proceedings of the First Convention of the Michigan Section, National Electric Light Association, 116 pages.

Two papers here given. Recent Legal Decisions Relating to Public Utility Companies, by James V. Oxtoby, 12 pages, and Load Factor, Diversity Factor, and Power Factor, their Effect on Small Central Stations, by Calvert M. Wardwell, 11 pages, as well as a number of shorter ones, with interesting discussions on them, contain many practical points of interest to central stations, the questions and answers being by men of experience in the legal and business handling of public utilities.

62—Character of Service.

ELECTRICITY IN HOTEL SERVICE, illustrated article, Electrical Review, 4½ pages, Dec. 21, 1912. p. 1159.

This is the second in a series of three articles on this subject, and is confined to lighting. It gives figures and information on the latest practice in this field.

62—Character of Service.

Electricity in Shoe Factories, by H. O. Stewart. Illustrated article, Electrical Review, 5 pages. Dec. 7, 1912, p. 1063.

Describes the advantages and economies to be gained by electric motor drive in the various departments of shoe manufacture.

91—Promotion and Growth of the Business.

Discussion on "The Relation of Central Station Generation to Railway Electrification," by Samuel Insull. Proceedings of the American Institute of Electrical Engineers, 39 pages. Dec., 1912, p. 2269.

This discussion contains most interesting information and facts contributed by men in charge of the largest electrical affairs in this country, on the general subject of consolidation of electric stations, and the various factors in the economy to be secured by combining separate plants and distribution lines into a great single system, supplying electricity to a vast region of country.

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For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

132— PROTECTION FROM COMPETITION

This compilation of the various decisions and opinions on competition is continued from 2 RATE RESEARCH 202.

MICHIGAN RAILROAD COMMISSION

Indeed, the purpose of the provision of the Michigan statute requiring the certificate of public convenience and necessity and the language of the section itself are so clear as to require no judicial interpretation to point the way to the law's proper administration. The general purpose of the provision can only be to prevent the needless duplication of telephone facilities: to prevent the financial loss and unsatisfactory service incident to the struggle of two or more companies within a territory that can supply no more than sufficient business for one. The degree of convenience and necessity which the Commission must find to warrant the granting of its certificate can not rest simply in the desire of the applicants. It is a question which rests rather in sound reason and discretion and is largely determinable by the fact of whether a given community has or has not efficient telephone service. . . .

The Vermontville Farmers' Independent Telephone Company can unquestionably construct a plant for the territory served, as one unit, at a less total cost than even the reproduction value of the property as found by the Commission; but the new company would divide rather than increase the revenue; it would greatly increase, if it did not double, the total operating and maintenance charge; it would duplicate facilities and limit the general telephone use, and in those cases where subscribers found it to their interest to install both instruments, it would entail practically a double burden of expense. In our judgment it cannot be said that it would be a venture of either private profit, or public convenience or necessity. The application will be denied, and an order to that effect will be entered.

Appl. of Vermontville Farmers' Ind. Tel. Co 1912.....Mich. R. C.

As far as we know, no other commissions have as yet passed on this point.

EDITORIAL NOTE.—All indented matter is direct quotation.

CALIFORNIA RAILROAD COMMISSION

While granting the franchise in this case, the Commission, nevertheless, laid down the following rules:

> While the general intent of this provision of the act is plain [Pub. Utilities Act., sec. 50, Subdiv's a, b, c, requiring certificate of necessity and convenience], its application to a particular contingency is surrounded by much difficulty. It certainly is true that where a territory is served by a utility which has pioneered in the field, and is rendering efficient and cheap service and is fulfilling adequately the duty which, as a public utility, it owes to the public, and the territory is so generally served that it may be said to have reached the point of saturation as regards the particular commodity in which such utility deals, then certainly the design of the law is that the utility shall be protected within such field. . . .
>
> If a territory is completely served and the utility has, to the best of its ability, given fair treatment to its patrons, as already intimated, this Commission will be slow to permit a competitor to come into its territory.

Pac. Gas & El. Co. v. Gt. Western P. Co. . . . Cal. R. C. 1912, Case No. 269.

KANSAS PUBLIC UTILITIES COMMISSION

> This case being at issue upon the application of The Citizens Electric Company and the protest of The Fort Scott Gas and Electric Company, and having been duly heard and submitted by the parties and full investigation of the matters and things involved having been had, the commission finds that the applicant has failed to show that public convenience and necessity would be promoted by permitting another electric light plant to engage in business in the City of Fort Scott, Kansas.
>
> It is therefore ordered that the application of The Citizens Electric Company be denied this 21st day of May, 1912.

In re Appl. The Citizens Electric Co. . Kan. P. U. C. Docket No. 288

> The obvious purpose of the legislature in enacting section 31 of chapter 238 of the Session Laws of 1911, commonly known as the public utilities law, was to prevent a duplication of utilities where one is rendering reasonably satisfactory service.
>
> The whole controversy in Parsons seems to be one over rates. In the opinion of the Commission, the present laws give a city of the first class sufficient power to regulate the rates of an electric light and power company. Express provision has been made in section 33 of the public utilities law for an appeal to this Commission by

either the utility or ten aggrieved taxpayers in case any right, privilege or franchise granted, or ordinance or resolution or part of any ordinance or resolution adopted by any municipal council or commission is unreasonable, or against public policy, or detrimental to the best interests of the city, or contrary to law.

Parsons Ry & Lt. Co. . . . . Kansas P. U.. C. Docket No. 179

OTHER AUTHORITIES

Delos F. Wilcox, Chief of the Bureau of Franchises of the Public Service Commission for the First District, New York, in his book on Municipal Franchises, Vol. 1, p. 29, says:

Although it is unusual for a city to grant a franchise that is in terms exclusive—and, indeed, in many states exclusive franchise grants are expressly prohibited by the constitution—in practice the natural tendency toward monopoly everywhere throttles competition. In spite of the practically uniform experience of cities, the authorities still cling to competition, as if it were a fetich, for the regulation of public service utilities. Year after year and decade after decade, the same old story is repeated, of franchises granted to new street railway companies, gas companies, electric companies, telephone companies, which in a few years, by the inevitable logic of events, either absorb their predecessors or are absorbed by them. The National Civic Federation, in its report on Public Ownership and operation, says: 'Public utilities, whether in public or in private hands, are best conducted under a system of legalized and regulated monopoly.' The reasons for this statement are not far to seek. The available space in the streets for the use of permanent fixtures is strictly limited. Furthermore, the construction and maintenance of any particular outfits of fixtures entails upon the public great inconvenience and loss through the tearing up of the streets, the obstruction of traffic, and the resulting dangers and inconvenience. It is apparent, therefore, that from the standpoint of the public interest, every permanent fixture placed in the street, whether overhead, on the surface or under ground, should be used to its full capacity before other similar fixtures are constructed, except such as may be built at convenient times in anticipation of future needs. From the standpoint of the companies supplying public services, the advantages of monopoly are obvious. Street railway tracts, gas and water pipes, electrical conduits, poles and wires, all require the investment of very large amounts of capital in providing the facilities for the distribution of the commodity or service. If one of these distributing systems is duplicated in the same streets or in the same territory, there is involved a duplication of investment which, with competitive rates, is ruinous to the enterprise.

After capital has once been invested in unnecessary fixtures, the pressure of competing rates leads the owners of the different fixtures to combine in order to maintain prices and avoid insolvency. Such combination is rendered comparatively easy by the fact that the number of possible competitors is very closely circumscribed by the physical limitations of the streets. A consolidation having once been effected, the public suffers a further inconvenience as a result of the abortive effort at competition. Having combined their interest, the companies naturally crowd up rates or skimp the service in order to be able to pay interest and dividends upon the large amount of capital wastefully invested. From the standpoint of the companies, there is still another reason for consolidation. In most of the public utilities aside from the matter of duplication of fixtures in the streets, there are great economies in unified operation. These savings appear in the manufacture of gas and electricity, in the development of water supply, and in the practical operation of street railway lines. It is generally much cheaper to manufacture electrical energy at a great central station than at a number of small plants operated independently of each other. The street railway system of a great city can be operated at less cost, if the same management controls all the lines and is thereby enabled to establish through routes, transfer cars at convenient points and adopt means to lessen congestion of traffic. From the standpoint of the public, there is also an advantage in unified administration, especially in the case of street railways and telephones, because unity of operation means greatly improved service. As a result, therefore, of the natural advantages, both to the public and to the companies, resulting from consolidation, there is a universal and practically irresistible tendency toward monopoly. The conclusion reached by the Civic Federation Committee is in line with reason and experience. In each center of population every public utility should be controlled and operated as a monopoly.

TYPICAL LAWS REQUIRING PERMISSION FROM THE PROPER PUBLIC AUTHORITY FOR THE RIGHT TO EXERCISE LOCAL FRANCHISES, ARE AS FOLLOWS:

Sections 25, 26, 27 of **Massachusetts Revised Laws**: ch. 121.

SECTION 25. In a city or town in which a gas company exists in active operation, or in which a person owns or operates works for the manufacture and sale of gas for light or heat, no other gas company, nor any other persons, shall dig up and open the streets, lanes and highways of such city or town, for the purpose of laying gas pipes therein, without the consent of the mayor and aldermen, or selectmen, granted after notice by publication or otherwise to all parties interested and a public hearing before them.

Section 26. In a city or town in which a company, corporation or person is engaged in the manufacture or sale of electric light, no other person, firm or corporation shall lay, erect, maintain or use, over or under the streets, lanes and highways of such city or town, any wires for the transmission of electricity for light, heat or power, except wires used for heat or power by street railway companies, without the consent of the mayor and aldermen of such city or selectmen of such town, granted after notice to all parties interested and a public hearing.

Section 27. Any corporation, company or person aggrieved by the decision of the mayor and aldermen of a city, or selectmen of a town, under the provisions of the two preceding sections, may, within thirty days from the notice of said decision, appeal therefrom to the board of gas and electric light commissioners, and said board shall thereupon give due notice and hear all parties interested, and its decisions thereon shall be final.

Wisconsin Laws, 1907, ch. 499, 1797m-74:

1. No license, permit or franchise shall be granted to any person, co-partnership or corporation to own, operate, manage or control any plant or equipment for the production, transmission, delivery or furnishing of heat, light, water or power in any municipality where there is in operation under an indeterminate permit as provided in this act a public utility engaged in similar service without first securing from the commission a declaration after a public hearing of all parties interested, that public convenience and necessity require such second public utility.

3. No municipality shall hereafter construct any such plant or equipment where there is in operation, under an indeterminate permit, as provided in this act, in such municipality a public utility engaged in similar service, without first securing from the commission a declaration, after a public hearing of all parties interested, that public convenience and necessity require such municipal public utility. But nothing in this section shall be construed as preventing a municipality acquiring any existing plant by purchase or by condemnation as hereinafter provided.

Neither the New Hampshire nor the New York statutes contain any express provision against competition, but in both cases the public service commission is given jurisdiction over the companies, which are prohibited from locating until such permit is obtained.

The **New Hampshire Law** was passed in 1911, and the commission has recently been appointed. The provision as to permits is as follows:

Sect. 13 (2) No public utility shall commence, within this state, the business of transmission of telephone, or telegraph messages, or of supplying the public with gas, electricity or water, or shall en-

gage in such business, or begin the construction of a plant, line, main or other apparatus or appliance intended to be used therein, in any city or town in which at the time it shall not already be engaged in such business, or shall exercise any right or privilege under any franchises hereafter granted (or any franchise heretofore granted but not heretofore actually exercised) in such town, without first having obtained the permission and approval of the commission. The commission shall grant such permission whenever it shall, after due hearing, determine and find that such engaging in business, such construction or such exercise of the right, privilege or franchise would be for the public good and not otherwise; and may prescribe such terms and conditions upon the exercise of the privilege granted under such permission as it shall consider for the public interest. Authority granted under the provisions of this section may only be exercised within two years after the same shall be granted, and shall not be exercised thereafter.

The **New York Act** is as follows:

68. Approval of incorporation and franchises; certificate. No gas corporation or electrical corporation, incorporated under the laws of this or any other state shall begin construction, or exercise any right or privilege under any franchise hereafter granted, or under any franchise heretofore granted but not heretofore actually exercised, without first having obtained the permission and approval of the proper commission. Before such certificate shall be issued a certified copy of the charter of such corporation shall be filed in the office of the commission, together with a verified statement of the president and secretary of the corporation, showing that it has received the required consent of the proper municipal authorities. No municipality shall build, maintain and operate for other than municipal purposes, any works or systems for the manufacture and supplying of gas or electricity for lighting purposes, without a certificate of authority granted by the commission. If the certificate of authority is refused, no further proceedings shall be taken before the commission, but a new application may be made therefor after one year from the date of such refusal.

New York.....Laws, 1910, ch. 48, sec. 68

COURT DECISIONS

222—**Accounts.**

Suit by the Texas and Pacific Railway Company et al., v. Railroad Commission of Texas et al., to enjoin the enforcement of certain orders prescribing a system of bookkeeping. Judgment for Railroad companies reversed on appeal, and on re-appeal modified. Decision of the Supreme Court of Texas, Nov. 13, 1912. 150 Southwestern Reporter, 878.

The decision holds that the commission has authority to order a uniform system of accounts, and dismisses the objections of the railroads that the order conflicts with that of the Interstate Commerce Commission, but rules

> This order of the Commission did not require the railroad companies to record any transactions had, or the results thereof, such as the number of passenger cars operated, and the miles run, etc., or the number of freight cars operated with the number of miles, whether loaded or empty; nor does the order require the entering of the cost of superintendence of each; nor to enter like facts with reference to any item of expense. Neither are the railroad companies directed by the circular to distribute or apportion any item of expense according to any known rule of law, business, or mathematics, but by arbitrary rules, it directs the apportionment to be made upon a purely conjectural basis of "car miles" in the ratio of two-thirds against passenger traffic, to one-third against freight. For example, if there be 10,000 car miles, and the cost of superintendence be $100,000, the passenger service would be charged with $66,666.66 2/3, and the freight service would be charged with $33,-333.33 1/3. There is no rule of law or business that will support that order as a compliance with the statute. . . .
>
> The orders contain some items which we think might be properly entered upon the books of a railroad company. But the matters are so connected with others, that we deem it wise for this court to leave it to the Commission to reconstruct its circulars in accordance with this decision; that is, matters to be prescribed for entry on the books of railroad companies must consist of facts and not conclusions, except such as bookkeeping would include.

131—Protection of the Corporation from Breach of Public Duty—Confiscatory Rates.

Petition of Receivers of Chicago, Peoria and St. Louis Railway Company v. Attorney General of Illinois, et al., alleging that the two-cent maximum passenger rate act is confiscatory. Decree for petitioners. Decision of Federal Court, Sept. 27, 1912. 199 Federal Reporter, 593.

After an extended investigation, the Master appointed, returned a report finding the passenger rate prescribed by the above act, passed by the Illinois Legislature in 1907, is confiscatory as applied to the railroad in question, and the decision sustains this finding.

81—**Municipal Regulation of Utilities.**

Appeal by the Pioneer Telephone and Telegraph Co. from an order of Oklahoma Corporation Commission prescribing maximum rates. Decision of Supreme Court of Oklahoma sustaining Commission's order. Oct. 22, 1912, 127 Pacific Reporter, 1073.

The telephone company relied upon an ordinance of the City Council of Oklahoma City, granting the right to automatically increase the rates for every 1,000 increase in telephones, and the case turned upon the question of whether it is the commission, or the city council, that has the governmental power of fixing and regulating municipal telephone rates. The decision holds,

> The power to authorize the construction and maintenance of telephone wires along or through the streets and alleys, and to grant franchises and rights to corporations for such purposes, whatever else it means, certainly contains no grant of power to the municipality to fix telephone rates by franchise or otherwise, and as part consideration therefor, as is here attempted. . . .
>
> They have not power to exact or receive compensation by way of free telephone service for themselves or for citizens, or to fix rates for telephone charges.

619—**Rate Differentials—Discounts.**

Suit by Vicksburg Waterworks Company to collect 10% additional on bills not paid on or before 10 days after rendered. Judgment for company reversed on appeal. Decision of Supreme Court of Mississippi, Oct. 28, 1912. 59 Southern Reporter, 880.

The decision says:

> [The Company] has not been empowered by law to impose upon and collect, from its debtors, fines for not paying their accounts promptly, and the only damage which the law contemplates that a creditor will suffer, by reason of the mere withholding of money due him, is legal interest thereon. The measure of all such damages is legal interest.

132—**Protection of the Corporation from Competition.**

Suit to Enjoin Competitor from Indemnifying Customers, Electrical World, Dec. 21, 1912, p. 1299.

There are two competing electrical companies in Louisville, Kentucky, the Louisville Lighting Company, and the Kentucky Electric Company. The latter in a suit, charges the former with employing unfair and unlawful means in visiting the customers of its competitor systematically, and inducing them to break their contracts, using the phrase, "We will indemnify and hold you harmless against any damages you may sustain by reason of discontinuing such electric service as you now have." The petition asks that the Louisville Lighting Company be enjoined from using this phrase in its contracts, and for $250,000 damages for unfair infringement of the business of the Kentucky Electric Company.

99— EMPLOYES

School for Salesmen of the Union Electric Light and Power Company, St. Louis, Mo.

The company has furnished Rate Research a description of its classes of instruction for its sales department employes. It was felt that many of the salesmen were not as familiar with the company's rate schedules, and general terms and conditions as they should be, and all the employes in this department were divided into three classes, the first or primary, numbers about sixty, composing new men, and those who have not gained a thorough understanding of the business; the intermediate, about fifteen men, advanced in matters of salesmanship, and rates pertaining to commercial lighting, and small power business; and the advanced class, about ten Industrial Power Engineers, and men advanced in all branches of the sales business of the company, with a graduate Industrial Engineer at the head of each class as instructor, who together with the Sales Manager and his assistant compose the faculty.

In the first class, the men are taught the rudiments in rate making, causes for certain rates, and the application of the rates to residential and ordinary commercial lighting, and small power service. They are also drilled with reference to the Company's handbook pertaining to terms and conditions for taking and handling business. In Class No. II the men are taught the application of rates in more complicated commercial lighting installations, and medium sized power installations, also illuminating engineering. The handbook is reviewed by this class from time to time. In Class III the men discuss various questions pertaining to proper powering of machinery, and various engineering topics with reference to large power installations. They also apply the schedule for large lighting, or mixed lighting and power installation, also review the handbook. In this class, from time to time, lectures will be given by engineers, on various subjects relative to the application of electric service to large industrial installations.

Promotion to a higher class is arranged for through oral and blackboard examinations.

The classes, which meet every other Saturday afternoon from two to five, have been running for about two months, and beneficial results have been very apparent, unquestionably producing better representatives for the company, thereby decreasing dissatisfaction and complaint.

83— MUNICIPAL OWNERSHIP

Preliminary Report of Committee Appointed by Mayor of Newburyport, Mass., to City Council, Progressive Age, Dec. 16, 1912, p. 1094.

This committee was appointed to investigate the electric light and gas problem, looking towards the municipal ownership of a plant. Some points given in the report are:

1. Municipalities can borrow money at a lower rate than can any private individual or corporation. 2. Operation by municipal authorities, by experience, has shown greater cost, and greater cost in the labor and supervision rather than for supplies and materials. . . . The superintendence, engineering and management are apt to be more expensive, both on account of larger salaries, and poorer quality of incumbents. All these items bear more heavily on a small plant than a large one. We believe on a small plant they become dominant as to almost exclude municipal operation. In the Newburyport plant we would deem it conservative to allow 15 per cent increase to cover the present operating cost. 3. City government interference has been, in some cases, a great load for municipal undertakings. This has been from two aspects, one by the establishment of unnecessary street lights and the profligate use of gas and electricity in the city's buildings; and second, the increase of operating expense by useless and inefficient officials. This is a danger, but we do not think it threatens our city. 4. The valuation of the property to be acquired is, by statute, to be determined by certain commissioners. If this valuation corresponds to the absolute engineering replacement value, with proper depreciation and amortization, we of course would have the full benefit financially between the city's borrowing rate and the industrial rate. There are, however, several things which come in to discount this. There are values attached to an industrial proposition which are, respectively, going value, franchise value, and future earning capacity. Going value is an opinion value, and one hard to determine accurately. It is apt to be abused, over-estimated, or confused with franchise value, or future earning capacity, or a cloak for a market value accrued to the securities of private corporations under the financial policy of their managers, together with the regulation of the state commissioners. The franchise value and future earning capacity are excluded as elements in valuation for municipal taking under the statute.

RATE REFERENCES

FORMS FOR FILING SCHEDULES

In connection with the Uniform Form for Filing Schedules recommended by the Rate Research Committee in its 1912 Report to the Seattle Convention, a summary of other forms now in existence may be of interest.

PUBLIC SERVICE COMMISSION (FIRST DISTRICT) NEW YORK

On January 15th, 1909, the Public Service Commission, New York City, issued its Tariff Circular No. 2 Prescribing the Form and Governing the Construction and Filing of Schedule of Rates and Forms of Contracts of Electrical Corporations. This was the first form of filing electric schedules ever adopted and was issued by the Commission in advance of any law giving the Commissions the right to prescribe a form of schedule, but with the consent of the nine operating electric companies in New York City. The order requires that schedules be on paper $8\frac{1}{2}$ by 11 inches in size and produced by some printing press process. The schedule must contain

> An exact copy of every form of contract and schedule of rates, each to be followed by an exact copy of every form of rider applicable thereto.
>
> A schedule could be cancelled only by a superceding schedule.
>
> Only one schedule, including one supplement, for each corporation may be in effect at any one time.
>
> Copies of all schedules to be posted in two public and conspicuous places in every office or place where applications for service are received in such manner as to be readily accessible to and conveniently inspected by the public.

It must be remembered that all of the companies operating in greater New York are relatively large companies and it was not especially burdensome to require that such schedules be printed or that the pamphlet form be used. For the smaller companies some form of loose leaf schedule seems imperative and for the very small companies mimeograph or typewritten schedules are sufficient.

The chief criticism of the New York form of schedule is that the exact form of contract is required to be printed in detail. Some of these contracts are rather involved and the essential elements of a rate calculation are difficult to determine from the contract form, especially as many of these forms contain blank spaces which must be filled out before the rate itself can be determined.

PUBLIC SERVICE COMMISSION (SECOND DISTRICT) NEW YORK

This Commission, in connection with the Empire State Gas and Electric Association, appointed a joint Committee soon after the enactment of the amendment to the law, which definitely gave the New York Commissions the right to prescribe forms of schedules. This Committee submitted a very complete report to the Commission and its recommendations became, with some slight changes, the basis of the Report adopted by the Rate Research Committee. It is expected that the Public Service Commission for the Second District, prior to February 1st, will issue its regulations prescribing the form for the filing and publishing of rate schedules for electric corporations, and its recently issued circular No. 62, General Regulations and Rulings for Rate Schedules of Telephone Corporations, is interesting as indicating the general tendency of the Commission in its forthcoming regulations for electrical corporations.

MICHIGAN RAILROAD COMMISSION

The Joint Committee of the Michigan Electric Companies and the Michigan Railroad Commission has issued a report upon form of schedules for electrical companies which follows very closely the report of the Second District New York Committee. (See. 2 R. R. 95.)

The Michigan Railroad Commission has taken no definite action as yet upon this report.

None of the other commissions have attempted to prescribe a form of schedule for electrical corporations.

CURRENT REFERENCES

2—**Public Service Regulation.**

New Legislation of Especial Interest to Gas and Electric Light Companies, and Municipalities Owning Lighting Plants, 1912, a 40-page pamphlet. Issued by the Commonwealth of Massachusetts, 1912.

This gives the legislation enacted in Massachusetts from February, 1912, up to July, 1912, on all matters pertaining to public service regulation.

2—**Public Service Regulation.**

Proposed New York Citizens' Committee to Safeguard Appointments to Public Service Commissions, Electrical World, Dec. 21, 1912, p. 1302.

Copies of a letter proposing the formation of a state-wide citizens' committee to secure non-partisan appointments to fill vacancies in the two public service commissions, have been sent to well-known men in every county in New York State. There are two vacancies in the New York State Commissions to be filled in the near future.

31—Valuation.

Central Station Statistics and Accounting, by Hermann Spoehrer, address before the Associated Engineering Societies of St. Louis, Dec. 11. Electrical World, Dec. 21, 1912, p. 1300.

Discusses the correct consideration of intangible values, franchise values when allowed, going value, the cost of reproduction method, interest during construction, and accrued depreciation.

315—Intangibles.

Retirement of Intangible Values, by Bion J. Arnold, testimony before the arbitration board reviewing the affairs of the Chicago City Railway Company. Electrical World, Dec. 21, 1912, p. 1307.

States the conclusion, after five years of considering some method of improving the Chicago traction settlement ordinance, that provision should have been made for retiring the intangible value placed on the property, and that this may be accomplished by dividing the net profit into three parts instead of two, as required now, one part to be set aside to retire intangible value (and the other two to go to the city and company), which sum, with interest, he believes would pay the amount required in twenty years. This method he has recommended for the proposed charter at San Francisco.

313—Prices.

Economics of Power-Transmission Lines, by Alfred Still, Electrical Review, 3 2/3 pages, Dec. 28, 1912, p. 1225.

This deals with the economics of the overhead power-transmission line from a broad practical standpoint, gives tables of estimates and curves of cost of materials.

32—Depreciation

Sanitary District's (Chicago, Ill.), Schedule of Depreciation. Electrical World, Dec. 28, 1912, p. 1352.

Gives rules and regulations of the Board of Trustees of the Sanitary District of Chicago, concerning methods of charging and schedule of depreciation adopted for the electrical department of this municipal corporation.

51—Cost of Service Theory.

Should the State Fix Rates on the Basis of a Fair Return Upon the Investment, by Albert C. Ritchie, address before the American Society of Jurisprudence, Washington, D. C., Dec. 21. Electrical Review, 2/3 page, Dec. 28, 1912, p. 1212.

States that it is of great importance that regulating bodies should recognize a standard for determining just and reasonable rates, and approves the cost of service theory which, properly understood, includes a fair return upon the capital invested, as the best method. Says that the objection sometimes urged, that to restrict the profits of a public service corporation to a fair return on the investment, would destroy business incentive and progressiveness of management, is disposed of by the fact that corporate efficiency is the efficiency of the operating department, and the public pays for this when it pays rates high enough to cover all operating salaries and expenses. Surely the public should not be required first to pay the salaries of efficient officers, and then to pay the investors an increased reward because they have employed efficient officers.

62—Character of Service.

ELECTRICITY IN HOTEL SERVICE, illustrated article, Electrical Review, 5 pages, Dec. 28, 1912, p. 1207.

This is the third and final article on this subject, and discusses briefly cooking and heating applications, and gives a summary of motor and lighting data on numerous hotels purchasing power.

619—Rate Differentials—Discounts

In 2 R. R. 193, in the reference to the Appropriation Act of the District of Columbia for 1900, the statement of the basic rate to which the deferred payment penalty was added, was accidentally omitted.

The reference should read:

> On and after the first day of June, eighteen hundred and ninety-nine, the maximum price of electric current sold or furnished to any consumer in the District of Columbia, shall be reduced from the present maximum of fifteen cents per Kilo-watt hour, to not exceeding ten cents per Kilo-watt hour. That if consumers other than the Government, shall not pay monthly electric bills within ten days after the same shall have been presented, said companies may charge and collect from said consumer so failing to pay said bill as aforesaid, eleven cents per Kilo-watt hour for the electric current furnished to said consumer during said month.

84—Municipal Operation

REDUCTION IN ONTARIO COMMISSION RATES. Electrical World, Dec. 28, 1912, p. 1361.

The Ontario Hydroelectric Commission, which sells Niagara Falls energy to Ontario municipalities, has announced rate reductions which will yield a saving of over $100,000 annually to the municipalities, the earnings of the company having given a surplus of $62,000 for its first fiscal year, over all expenses except sinking fund. The latter is computed at $72,000, and should increase in consumption continue during the coming year it is intimated that still further reductions may be made.

91—Promotion and Growth of the Business

CENTRAL STATION CONSOLIDATION. Article and editorial, Electrical World, 1½ pages, Dec. 28, 1912, p. 1351, 1353.

This gives a table of the results of an investigation into the ownership or control of central stations in cities having a population of 5,000 or more, and shows that the percentage now controlled by syndicates alone is 40.9, by independent companies alone 39.7, by municipal plants alone, 11.2, and by combinations of the three 8.2 per cent. Central station consolidation has proceeded very rapidly within the last few years, as one instance, the Central Illinois Public Service Company has bought fifty-five Illinois electric properties since August of this year, most of them in small towns. An estimate of 1,200 as the number of central stations, or other related public utilities, under syndicate control, is probably close to the mark. The number of communities served by syndicate-owned plants is, of course, far larger. As against occasional instances of loose financing, and inadequate depreciation reserves, or insufficient maintenance, or both, the compelling advantages of consolidation are, the better service rendered by the large company, having greater resources in men and capital than the small company can command, the economy in operating a group of properties, in purchasing for many plants instead of one, and in the possibility of making a few plants tied together with transmission lines do the work of many.

If the movement becomes one of financial exploitation, it will be checked. But if it works out to the advantage of the public and the investor, it will doubtless go on, and we shall secure the blessings of concentration in public-utility control, without the disadvantages of the earlier movement of the same nature among railways and industrials.

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For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

PUBLIC SERVICE REGULATION

2—Public Service Regulation in the Various States.

The following is a list of the regulatory bodies which have been established in the various states for regulation of public utilities, with the sources of their authorization, and special reference is made to their jurisdiction over electric light companies.

The states in which commissions have jurisdiction over gas and electric companies are:

ARIZONA.

CORPORATION COMMISSION,
PHOENIX, ARIZONA.
Const., Art. XV, Secs. 1, 18.
Session Laws, 1912, Ch. 90.
Jurisdiction over all utilities except municipal.
CHAIRMAN, W. P. GEARY.
Date original law effective over electric companies, June, 1912.

CALIFORNIA.

RAILROAD COMMISSION OF THE STATE OF CALIFORNIA,
SAN FRANCISCO, CALIFORNIA.
Stats., 1911, 1st ex. sess. ch. 14.
General jurisdiction over all public utilities, except that municipalities are allowed to establish local Commissions, in which case the State Commission has no jurisdiction.
PRESIDENT, JOHN M. ESHLEMAN.
SECRETARY, CHARLES R. DETRICK.
Date effective over electric companies March 23, 1912.

LOS ANGELES

PUBLIC UTILITY COMMISSION OF LOS ANGELES.
This is the only city that has exercised its privilege of retaining or organizing a local utility commission in this State.

CONNECTICUT.

PUBLIC UTILITIES COMMISSION,
HARTFORD, CONNECTICUT.
P. A., 1911, ch. 128.
General jurisdiction over all utilities except municipal.
PRESIDENT, RICHARD T. HIGGINS.
CLERK, HENRY F. BILLINGS.
Date effective over electric companies Sept. 9, 1911.

EDITORIAL NOTE.—All indented matter is direct quotation.

GEORGIA.

RAILROAD COMMISSION OF GEORGIA,
ATLANTA, GEORGIA.

Code, 1911, as amended. Sec. 2662.
General jurisdiction over all public utilities except municipal.
CHAIRMAN, CHARLES MURPHY CANDLER.
SECRETARY, CAMPBELL WALLACE.
Date effective over electric companies August 22, 1907.

KANSAS.

PUBLIC UTILITIES COMMISSION,
TOPEKA, KANSAS.

Laws, 1911, ch. 238.
General jurisdiction over all public utilities except municipal. The law is modeled after Wisconsin, but without the provision for indeterminate permits.
CHAIRMAN, GEORGE PLUMB.
RATE CLERK, E. H. HOGUELAND.
Date effective over electric companies 1911.

MARYLAND.

PUBLIC SERVICE COMMISSION,
BALTIMORE, MARYLAND.

Laws, 1910, ch. 180.
General jurisdiction over all public utilities. The law contains this unusual and important provision:

> Every such valuation shall be so made and ascertained by the Commission that so far as possible it shall not disturb the value of bonds of any of said corporations issued prior to the passage of this Act.

CHAIRMAN, PHILIP D. LAIRD.
SECRETARY, LOUIS M. DUVALL.
Date effective over electric companies April 5, 1910.

MASSACHUSETTS.

Massachusetts, with the oldest of all the public utility laws, has three commissions, with divided jurisdiction over different utilities; the Governor and others in the state, have urged establishing a single commission with mandatory powers, and it is probable the Legislature will enact such a law soon.

BOARD OF RAILROAD COMMISSIONERS.

THE HIGHWAY COMMISSION
with jurisdiction over telephones and telegraphs.

BOARD OF GAS AND ELECTRIC LIGHT COMMISSIONERS,
BOSTON, MASSACHUSETTS.

Revised Laws, 1902, ch. 121.

Jurisdiction—cannot fix rates on its own initiative, full power over stock and bond issues.

CHAIRMAN, FORREST E. BARKER.
CHIEF CLERK, ROBERT G. TOBEY.
Date effective over electric companies June 8, 1887.

MICHIGAN.

MICHIGAN RAILROAD COMMISSION,
LANSING, MICHIGAN.

Pub. Acts, 1909, no. 300.
Pub. Acts, 1911, no. 138.
Jurisdiction over electric rates.
Pub. Acts, 1909, no. 106.
Over issues of stocks and bonds of electric companies.
Pub. Acts, 1909, no. 144.
CHAIRMAN, CASSIUS L. GLASGOW.
SECRETARY, WILLARD N. SWEENEY.
Date effective over electric companies May 19 (electric rates) and May 26, 1909 (stocks and bonds).

NEBRASKA.

NEBRASKA STATE RAILWAY COMMISSION,
LINCOLN, NEBRASKA.

Stats., 1907, Sec. 10650.
Jurisdiction over electric light companies only over stock and bond issues.
CHAIRMAN, H. J. WINNETT.
SECRETARY, A. B. ALLEN.
Date effective over electric companies 1909.

NEVADA.

PUBLIC SERVICE COMMISSION OF NEVADA,
CARSON CITY, NEVADA.

Stats., 1911, ch. 162.
General jurisdiction over light, heat and power companies.
CHAIRMAN, H. F. BARTINE.
SECRETARY, E. H. WALKER.
Date effective over electric companies March 23, 1911.

NEW HAMPSHIRE.

PUBLIC SERVICE COMMISSION,
CONCORD, NEW HAMPSHIRE.

Laws, 1911, ch. 164.
General jurisdiction over all utilities.
CHAIRMAN, EDWARD C. NILES.
CLERK, JOHN E. BENTON.
Date effective over electric companies May 15, 1911.

NEW JERSEY.

BOARD OF PUBLIC UTILITY COMMISSIONERS,
TRENTON, NEW JERSEY.

Laws, 1911, ch. 195.

General jurisdiction over all utilities. This law is to be commended for its excellent arrangement, and is modeled after the Wisconsin and New York laws, but with no provision for indeterminate permits.

CHAIRMAN, THOMAS J. HILLERY.
SECRETARY, ALFRED N. BARBER.

Date effective over electric companies April 21, 1911.

NEW MEXICO.

STATE CORPORATION COMMISSION,
SANTA FE, NEW MEXICO.

Const., Art. XI, Sec. 1-6.

Jurisdiction—has certain authority over all corporations but no rate jurisdiction over electric companies.
Date effective over electric companies January 6, 1912.

NEW YORK.

PUBLIC SERVICE COMMISSION (1st D., N. Y.),
NEW YORK CITY.

Consolidated Laws, 1910, ch. 42.

General jurisdiction over all utilities except telephone and water in New York City.

This law, established under Governor Hughes, has had a great influence upon public service law in other states. The original act was incomplete as to electric companies, but amendments made in 1909, 1910, 1911 and 1912 have resulted in a law which on the whole is very satisfactory.

CHAIRMAN, WILLIAM R. WILLCOX.
SECRETARY, T. H. WHITNEY.

Date effective over electric companies July 1, 1907.

PUBLIC SERVICE COMMISSION (2nd D., N. Y.),
ALBANY, NEW YORK.

Has jurisdiction in New York State outside of Greater New York, over all utilities except water, and jurisdiction over telephones throughout the entire state.

Authorization and date effective same as above.

CHAIRMAN, FRANK W. STEVENS.
SECRETARY, J. S. KENNEDY.

OHIO.

PUBLIC SERVICE COMMISSION OF OHIO,
COLUMBUS, OHIO.

Laws, 1911, page 549.
General jurisdiction over all utilities, with the exception of some specified municipal jurisdiction over rates.

CHAIRMAN, O. P. GOTHLIN.
SECRETARY, C. A. RADCLIFFE.
Date effective over electric companies, May 31, 1911.

OKLAHOMA.

CORPORATION COMMISSION,
OKLAHOMA CITY.

Const., Art. IX.
Some jurisdiction over all utilities except municipal, but no control over stock and bond issues, the approval of franchises, and the granting of certificates of public convenience and necessity.

CHAIRMAN, J. E. LOVE.
SECRETARY, J. H. HYDE.
Date effective over electric companies May 19, 1908.

OREGON.

RAILROAD COMMISSION OF OREGON,
SALEM, OREGON.

Laws of 1911, ch. 279.
General jurisdiction over all utilities except municipal. This law is modeled almost directly after the Wisconsin law, except that Oregon excludes municipal plants from state regulation, and no provision is made for indeterminate permits.

CHAIRMAN, CLYDE B. AITCHISON.
SECRETARY, H. H. COREY.
Date effective over electric companies November 5, 1912.

RHODE ISLAND.

PUBLIC UTILITIES COMMISSION,
PROVIDENCE, RHODE ISLAND.

Laws, 1912, ch. 795.
General jurisdiction over all utilities. This law is modeled in parts after the Wisconsin law, but does not provide for indeterminate permits.

CHAIRMAN, WILLIAM C. BLISS.
Date effective over electrical companies April 17, 1912.

VERMONT.

PUBLIC SERVICE COMMISSION,
NEWPORT, VERMONT.

Laws, 1908, No. 116.
General jurisdiction over all utilities.
This law is a modification of the old railroad law.
CHAIRMAN, JOHN W. REDMOND.
CLERK, RUFUS W. SPEAR.
Date effective over electrical companies, April 1, 1909.

VIRGINIA.

STATE CORPORATION COMMISSION,
RICHMOND, VIRGINIA.

Const., Sec. 155, et seq., Code, 1904, Sec. 1313a.
Limited jurisdiction over all corporations.
CHAIRMAN, ROBERT R. PRENTIS.
SECRETARY, R. T. WILSON.

WASHINGTON.

PUBLIC SERVICE COMMISSION OF WASHINGTON,
OLYMPIA, WASHINGTON.

Laws of 1911, ch. 117.

Has no jurisdiction over stock and bond issues, mergers or consolidations, nor over municipal utilities. In other respects the law is based on New York and Wisconsin laws, but without provision for indeterminate permits.

CHAIRMAN, GEORGE A. LEE.
SECRETARY, F. M. LARNED.
Date effective over electric companies June 8, 1911.

WISCONSIN.

RAILROAD COMMISSION OF WISCONSIN,
MADISON, WISCONSIN.

Laws, 1907, ch. 582, Sec. 1797.

General jurisdiction over all utilities including municipal. This is probably the most important of all the laws to a student of regulation. The most important provision is that for indeterminate permits, which allow for the purchase of privately owned plants by municipalities with the approval of the Commission, and, in return, guarantee monopoly and fair rates to the utility.

The effect of this law in preventing unsatisfactory competition and rate wars has been notable.
CHAIRMAN, JOHN H. ROEMER.
SECRETARY, J. M. WINTERBOTHAM.

States in which commission jurisdiction does not include gas and electric companies are:

ALABAMA.

RAILROAD COMMISSION OF ALABAMA,
MONTGOMERY, ALABAMA.

Code, 1907, Sec. 5632.

PRESIDENT, CHARLES HENDERSON.
SECRETARY, S. P. KENNEDY.

ARKANSAS.

RAILROAD COMMISSION,
LITTLE ROCK, ARKANSAS.

Acts, 1907, No. 422, Sec. 5.
Kirby's Digest, 1904, as amended. Secs. 6788-6801.

CHAIRMAN, R. P. ALLEN.
SECRETARY, W. E. FLOYD.

COLORADO.

STATE RAILROAD COMMISSION OF COLORADO,
DENVER, COLORADO.

Laws, 1910, special sess., ch. 5.

PRESIDENT, AARON P. ANDERSON.
SECRETARY, DANIEL H. STALEY.

On November 5, 1912, the proposed constitutional amendment providing for a public utilities court and commission was defeated by referendum vote.

FLORIDA.

RAILROAD COMMISSIONERS OF THE STATE OF FLORIDA,
TALLAHASSEE, FLORIDA.

Gen. Stats., 1906, Sec. 2912.

CHAIRMAN, R. HUDSON BURR.
SECRETARY, J. WILL YON.

ILLINOIS.

RAILROAD AND WAREHOUSE COMMISSION,
SPRINGFIELD, ILLINOIS.

Revisal, 1909, as amended, ch. 114, Secs. 130, et seq.

CHAIRMAN, ORVILLE F. BERRY.
SECRETARY, WILLIAM KILPATRICK.

The Legislature in 1911, appointed a special Legislative Public Utilities Commission to investigate the need of such a regulating body for the State of Illinois. This special Commission reports to the Illinois Legislature in January, 1913.

INDIANA.

RAILROAD COMMISSION,
INDIANAPOLIS, INDIANA.

Acts, 1907, ch. 231, Sec. 14, ch. 241, Secs. 1, 2, 16.
CHAIRMAN, WILLIAM J. WOOD.
SECRETARY, JOSEPH L. REILEY.

It is expected that Governor Marshall will recommend and that the 1913 Legislature will pass a public utilities bill. Several bills have already been drafted.

IOWA.

BOARD OF RAILROAD COMMISSIONERS,
DES MOINES, IOWA.

Laws, 1911, ch. 94, Secs. 1, 3, 5.
Code, 1897, as amended, Secs. 2111, et seq.
CHAIRMAN, N. S. KETCHUM.
SECRETARY, GEORGE L. McCAUGHAN.

KENTUCKY.

RAILROAD COMMISSION,
FRANKFORT, KENTUCKY.

Carroll's Stats., 1909, as amended, Secs. 821, et seq.
Const., Sec. 209.
CHAIRMAN, L. B. FINN.
SECRETARY, R. TOBIN.

A public utility bill is being urged in this state and will be considered by the next legislature.

LOUISIANA.

RAILROAD COMMISSION OF LOUISIANA,
BATON ROUGE, LOUISIANA.

Const., 1898, Art. 283.
CHAIRMAN, J. J. MEREDITH.
SECRETARY, HENRY JASTREMSKI.

MAINE.

RAILROAD COMMISSION,
AUGUSTA, MAINE.

Rev. Stats., 1903, as amended, ch. 51, Secs. 48, 64; ch. 53, Sec. 30; ch. 116, Sec. 1.
CHAIRMAN, ELMER P. SPOFFORD.
CLERK, GEORGE F. GIDDINGS.

MINNESOTA.

RAILROAD AND WAREHOUSE COMMISSIONERS,
ST. PAUL, MINN.

Rev. Laws, 1905, as amended, Secs. 1953-1962.
Laws, 1907, ch. 449, Sec. 2.
Laws, 1911, ch. 156, Secs. 2, 11.
CHAIRMAN, IRA B. MILLS.
SECRETARY, A. C. CLAUSEN.

MISSISSIPPI.

MISSISSIPPI RAILROAD COMMISSION,
JACKSON, MISSISSIPPI.

Code, 1906, Sec. 4830.
Laws, 1908, ch. 84.
CHAIRMAN, F. M. SHEPPARD.

MISSOURI.

RAILROAD AND WAREHOUSE COMMISSION,
JEFFERSON CITY, MISSOURI.

Rev. Stats., 1909, as amended, Secs. 3205, et seq.
CHAIRMAN, F. A. WRIGHTMAN.
SECRETARY, T. M. BRADBURY.

Missouri has no State public service commission, but an enabling act, Session Acts 1907-8, 119, Revised Statutes 1909, Sec. 8797, 9550, authorized local commissions and under this act the following have been organized:

Public Service Commission, St. Louis
Public Utilities Commission, St. Joseph
Public Utilities Commission, Joplin
Public Utilities Commission, Chillicothe
***Public Utilities Commission, Kansas City.**

*This Commission was discharged by the mayor in 1912.

MONTANA.

BOARD OF RAILROAD COMMISSIONERS,
HELENA, MONTANA.

Rev. Codes, 1907, as amended, Secs. 4363, et seq.
CHAIRMAN, B. T. STANTON.
SECRETARY, R. F. McLAREN.

NORTH CAROLINA.

CORPORATION COMMISSION,
RALEIGH, N. C.

Rev., 1905, Sec. 1054.
CHAIRMAN, FRANKLIN McNEILL.
SECRETARY, A. J. MAXWELL.

NORTH DAKOTA.

BOARD OF RAILROAD COMMISSIONERS OF NORTH DAKOTA,
BISMARCK, NORTH DAKOTA.

Rev. Codes, 1905, Sec. 364.
PRESIDENT, W. H. STUTSMAN.
SECRETARY, THOMAS HALL.

PENNSYLVANIA.

PENNSYLVANIA STATE RAILROAD COMMISSION,
HARRISBURG, PENNSYLVANIA.

Laws, 1907, No. 250.
CHAIRMAN, NATHANIEL EWING.
SECRETARY, ARCHIBALD B. MILLER.

Important bills have been prepared by the three political parties in this State and will be presented to the 1913 Legislature and it is expected that a utility bill will be passed at this session.

SOUTH CAROLINA.

RAILROAD COMMISSION,
COLUMBIA, SOUTH CAROLINA.

Const., 1895, Art. IX, Sec. 14.
CHAIRMAN, G. McD. HAMPTON.
SECRETARY, J. B. DARBY.

SOUTH DAKOTA.

BOARD OF RAILROAD COMMISSIONERS OF SOUTH DAKOTA,
PIERRE, SOUTH DAKOTA.

Rev. Pol. Code, 1903, as amended, Sec. 186, et seq.
CHAIRMAN, GEORGE RICE.
SECRETARY, T. E. CASSILL.

TENNESSEE.

RAILROAD COMMISSION,
NASHVILLE, TENN.

Acts, 1897, ch. 10, Secs. 1, 2, 3 (as amended 1907), 4, 6.
CHAIRMAN, B. A. ENLOE.
SECRETARY, MISS WILLIE FIELDS.

TEXAS.

RAILROAD COMMISSION OF TEXAS,
AUSTIN, TEXAS.

Const., Art. XVI.
CHAIRMAN, ALLISON MAYFIELD.
SECRETARY, E. R. McLEAN.

COMMISSION DECISIONS—NEW JERSEY

2—Public Service Regulation.

Complaint of the Mayor of Paterson, N. J., July 9, 1912, and later, petition of the City of Passaic for inquiry as to the reasonableness of the gas rates charged by the Public Service Gas Company. Decision of New Jersey Board of Public Utility Commissioners, reducing the rates.—Electric Railway Journal, 2 pages, Jan. 4, 1913, p. 35.

This decision just handed down, is a most important one, giving rulings on going value and franchises, good will, the amount to be allowed capitalized of the securities issued at the time of the merger, and the rate of return on the valuation as found by the board.

The board determines the existing rate of $1.10 per 1000 cu. ft. of gas, with a discount of 10 cents for prompt payment, to be unjust and unreasonable, and fixes a charge of 90 cents per thousand for the Passaic Division on and after February 1, 1913. It also recommends that the company adopt this same rate throughout all of the other divisions of the state, where the existing rate is now $1.00. It issues its "recommendation" instead of order, for the territory outside of the Passaic Division, because under the statute, it can only issue an order fixing rates "after hearing, upon notice."

The total value as found by the board is $4,750,000, the company submitted a valuation of $8,909,491.

Some important paragraphs of the decision are:

315—Intangibles—Good Will.

For good will we allow nothing whatever. The company, we understand, makes no claim for good will. It seems well settled also that where a particular service is furnished by only one company within a given area, the option of patronizing a rival public concern is absent, and that under such circumstances good will, or the value of voluntary patronage where a competing service is available, does not exist.

315—Intangibles—Going Value.

A plant with a business attached has a value greater than the value of the mere plant without the business attached. . . . The going concern value will then be largely represented by the cost of developing the business as distinct from the cost of securing the physical structure. . . .

In case it transpires that such excess value, known as 'going concern value,' exists, and in case the costs involved in the acquisition of such value have been met out of rates exacted from consumers, should such excess value, known as 'going concern value,' enter into the base upon which public utilities are entitled to earn a fair return? . . .

We see no escape from the necessity of recognizing the intangible property designated as 'going concern value' as well as actual physical structures similarly obtained as constituting part of the present lawful possessions of a public utility, even though both these tangible and intangible values were built up in the past out of rates exacted from consumers, it being always assumed that the rates exacted were not legally assailed or assailable. . . .

The business thus acquired must be regarded as a legitimate part of the property of the company. We cannot equitably project back into the unregulated past a form of prices that might today be regarded as fair and adequate, and assume that actual rates exacted in the past, in so far as they exceed what are now deemed fair, have not lawfully become the property of the company. If these high rates in the past have been employed by the company to acquire intangible property in the shape of extensive patronage, that expectation of patronage is theirs, and on its fair value the company is entitled to a return. It may, or may not, be a subject of regret that regulation was so long deferred, but deferred regulation is no excuse for refusing at present to allow a fair return upon what is the lawful property of the company. . . .

112—Franchises.

It is the public policy of the State of New Jersey at present not to allow capitalization of franchises for an amount in excess of the actual cost involved in obtaining said franchises. That this is a wise and equitable policy we think is incontestable. One of the characteristic features of a public utility such as a gas company is that it does not possess and ordinarily cannot afford to purchase the land requisite for the location of its distributing apparatus. When by its secondary franchises such permits to locate are granted to a company without other expense than the necessary business and legal costs of securing municipal consents, it seems unthinkable, as a matter of equity and public policy, that the easements gratuitously granted should be made the basis for an additional charge to be imposed upon the grantor. . . .

It is quite obvious that our finding as to the total amount of intangible property ($1,025,000) is tantamount to including the franchises of the company at a moderate rating, at a value comparable with the cost of obtaining these or similar franchises. It amounts therefore to a practical denial of the company's contention as to the value of its franchises. The figures claimed for the franchises . . . by . . . the company . . . considerably exceed our appraisal of the company's entire intangible property. . . .

33—Capitalization.

The company contended before the board that the par value of securities originating in the merger of six different gas and electric concerns in this district in 1899 determine an amount below which the board's aggregate valuation could not fall. This contention is expressly denied by the board, which rules:

Both at common law, and now in this State by statute, a public utility assumes the responsibilities of furnishing safe, proper and adequate service at reasonable rates and that it undertakes its business with explicit knowledge of the State's right and power to set reasonable rates, that any capitalization it effects is effected subject to the State's reserved power in the premises and that it cannot plead its capitalization nor any contracts it may have undertaken as barring the State's exercise of its power as to rates. When, moreover, the capitalization, albeit legal, is demonstrably in excess of the value of its assets at the time of capitalization, the public utility cannot cite its unchallenged capitalization as a bar to the State's exercise of inherent prerogative.

34—Rate of Return.

The board states that it does not wish to go on record as favoring any particular rate of return applicable to all cases. It declares, however, that the return must be sufficient to attract the large amount of capital required each year in making the additions and extensions to plant and distribution system which the growth in communities demands. The price fixed, 90 cents per 1000 cu. ft. will afford a return of approximately 8 per cent on the value of the property as found by the board.

92—Economy and Efficiency.

The board finds that the general efficiency of the company is at least as good as, and probably better than, the average of the companies with which comparisons have been made.

CURRENT REFERENCES

69— RATE SCHEDULES—MICHIGAN

The Michigan Railroad Commission on December 5, issued its Rate Department Circular No. 7, ordering Michigan companies to file schedules on or before Jan. 15, 1913, in the form recommended in the report of the Joint Committee of the Michigan Electric Companies and the Michigan Railroad Commission mentioned in 2 Rate Research 218.

2—Public Service Regulation.

State Regulation of Public Utilities, by Morris Knowles, C. E., and discussion. Journal of the New England Water Works Association, 11 pages, Sept., 1912, p. 272.

This paper mentioned in 2 R. R. 43, now reprinted as above, is an admirable review of public service regulation, showing its development to meet present day economic conditions, the principles and methods that are being worked out, and the benefits it has already bestowed on the public, and on utilities.

2—Public Service Regulation.

The Empire State Gas and Electric Association, 29 West 39th Street, New York, announces that it will continue to send out its weekly notice cards of bills pending before the State Legislature, and of opinions and orders of the Public Service Commission.

31—Valuation.

Valuation Methods and Plans Analyzed, Report of the Committee on Railroad Taxes, and Plans for Ascertaining Fair Valuation of Railroad Property, of the National Association of Railway Commissioners, Public Service Regulation, 11 pages, Dec., 1912, p. 757.

This report, briefly abstracted in 2 R. R. 139, is given as above, in some fulness, and forms an excellent discussion of every branch of this important subject by men experienced in making valuations.

5—Rate Theory and Development.

Bases for Railway Rates, Report of the Committee on Rates and Rate Making, of the National Association of Railway Commissioners, Public Service Regulation, 4 pages, Dec., 1912, p. 768.

While this study was made on railroad rates, yet the principles discussed make it of interest for those engaged in working out the problems of electric rates, as some of the difficulties and misconceptions to be met are similar in the two fields. It argues for greater uniformity in rate regulating methods, to be attained by recognizing broad general principles of rate fixing, and states that the trouble seems to be that rates are not made upon a scientific basis, but are a matter of development, which development has followed the lines of least resistance rather than any logical plan. The report approves the cost of service as the proper basis for rates.

The convention unanimously adopted a resolution that there should be appropriate legislation by Congress, authorizing and directing the Interstate Commerce Commission, assisted by a body of disinterested experts appointed by the Commission, and paid by the federal government, to frame and promulgate a classification of rates to apply uniformly over the United States.

51—Cost of Service Theory.

THE COST OF ISOLATED PLANT POWER, AS GENERATED BY NON-CONDENSING ENGINES, WITH EXHAUST STEAM USED FOR HEATING OR INDUSTRIAL PROCESSES, a 16-page pamphlet issued by the American Engine Company, Bound Brook, N. J.

Gives data to show that, where steam heating is required, electric power may be generated as a by-product of the heating plant, at a cost of less than 2 cents per kilowatt hour in the majority of cases, and claims that though the central station, because of the maximum economy possible in a large plant, can produce current at 1 cent per kilowatt hour, yet the elaborate and expensive transmission and distributing system necessary to deliver it, on which interest, depreciation and maintenance must be paid, raises the price to the consumer, necessitating rate discrimination, so that finally it is only the favored customer who obtains power at a reasonable charge, while the small user bears the burden.

619—Rate Differentials—Discounts.

Complaints of the City of Newark v. Public Service Electric Company and Public Service Gas Company, demanding larger rate of discount. Decision of the New Jersey Board of Public Utility Commissioners dismissing the complaints. Public Service Regulation, Dec., 1912, p. 807.

The city contended that the companies, having established a rate of discounts, increasing with consumption, the total consumption of all the city buildings should be used as the basis of its discount. The board ruled that as the building are located in different parts of the city, at distances apart, it would be a discrimination in favor of the city, unless the same rule applied to all owners of more than one piece of segregated property.

62—Character of Service.

CENTRAL STATION ICE-MAKING, illustrated article, Electrical Review, 6 pages, Jan. 4, 1913, p. 17.

States that an ice-making plant as an adjunct to an electric central station, possesses features which enable the two plants to be run on a more economical basis than would be possible with either plant running singly. Presents reports from numerous localities showing that ice profits oftentimes exceed profits from the electric station.

62—Character of Service.

READINESS TO SERVE METHODS—ELECTRIC POWER ON THE FARM, by ROSS B. MATEER, Journal of Electricity, Power and Gas, 1½ pages, Dec. 28, 1912, p. 580.

Gives data from an investigation of the operating costs of motors used to run pumps, corn shellers, fodder cutters and many other devices for doing agricultural and domestic labor on farms.

99—Employes

PUBLIC SERVICE WOMEN WORKERS. Electrical World, Dec. 28, 1912, p. 1360.

The Public Service Corporation of New Jersey which controls the greater part of the gas, electric lighting, and electric railway business of the state, has announced that it will put into effect, on Jan. 1, 1913, a minimum wage of $9 a week for its women employes, of whom there are some 300.

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RATE RESEARCH

PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

Vol. 2. CHICAGO, JANUARY 15, 1913 No. 16

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

619— **MINIMUM CHARGES**

The following is a compilation of the most important court and and commission decisions, and authoritative opinion on the subject of minimum charges by public utility corporations.

CALIFORNIA.

THE RAILROAD COMMISSION OF CALIFORNIA has as yet handed down but one ruling, affecting electric companies, on the subject of Minimum Charges, which is as follows:

> It is hereby ordered that the Mt. Whitney Power and Electric Company be, and the same is, hereby authorized to put into effect, until the further order of this Commission, a new form of meter contract or regulation, providing for a minimum charge of twenty-four ($24.00) dollars a year, in accordance with the form and terms of the contract attached to the application in this proceeding.

Also the following, in a decision of a water rates case, Dec. 6, 1912, endorses the principles of the minimum charge:

> Furthermore, the flat rate offers no opportunity to distribute the burden of cost upon a fair basis of quantity of service furnished the consumer, because within the limit of the flat rate the smallest consumer pays as much as the largest. This principle must not be carried to the extent of preventing the establishment of a fair minimum charge, for this latter is based on the necessity of compelling each consumer to bear some part of the burden of furnishing the utility.

ARIZONA.

THE ARIZONA CORPORATION COMMISSION has handed down an interim rate order of date, Sept. 14, 1912, containing the following clauses:

> That the meter rental heretofore made, charged and collected by the defendant company, is hereby abolished.
> That until the further order of the commission, no readiness to serve or maintenance charge for electricity shall be made by the

EDITORIAL NOTE.—All indented matter is direct quotation.

defendant company to exceed $1.50 per month, and in no case shall said charge be made except in case the electricity consumed in any month, charged for at the regular rates, shall be less than the sum of $1.50, and in such case no charge will be made for the electricity consumed.

And the following statement, of date, Nov. 7, 1912, by Mr. W. P. Geary, Chairman of the Arizona Corporation Commission, indicates the views of the Commission on this point:

The last session of the Legislature provided by statute that gas, electricity and water measured through a meter, would be charged for, according to the exact amount used, and that no other charge should be made. This, however, does not meet the approval of the Commission, and we expect that when the Legislature again convenes (probably this month) this law will be amended so as to permit a minimum charge being made.

SUPREME COURT OF KANSAS.

The council evidently deemed it proper and reasonable to collect 50 cents a month from each patron, whether he used gas amounting to that sum during the month or not, on the theory that this minimum sum would pay for reading meters and other services performed by the city in connection with the service, although the amount of gas used in one month might not entitle the city to this sum. . . .

The regulation being one contained in an ordinance, it is presumptively reasonable until the contrary is shown, or unless it is unreasonable or discriminatory on its face, . . . and it not appearing prima facie unreasonable, but reasonable, it must . . . be upheld.

Cunningham et al. v. City of Iola et al. . . .119 Pacific Reporter, 317

MASSACHUSETTS BOARD OF GAS AND ELECTRIC LIGHT COMMISSIONERS.

It is conceded on all sides that a public service corporation is entitled to secure from its customers as a whole a sufficient revenue by which it may live and prosper; and where, as in this case, it has a business well established, the imposition of such a charge is probably of more consequence to the general body of its customers than to the company itself. In other words, the interests of the company and those actual users of electricity who are dependent on the company for their supply, are so far identical that it is desirable from the standpoint of both, perhaps more emphatically from that of such consumers, that the company's business shall expand and develop along profitable rather than unprofitable lines, so far at least as may be consistent with a proper regard to the company's duty as a public servant. Electricity is fast becoming one of the

common conveniences, and even necessities of life, and the Board believes that it should be made available to a much larger portion of the community than it now is. But, in view of the constant advancement in the art, and of the large investment incident to placing wires underground in many cities, a too rapid expansion of the company's business in directions where, under present conditions, there is no substantial demand, may perhaps hinder, rather than help, that promotion of its use which the Board believes is on the whole so desirable. It is largely because of these considerations that the Board reached the conclusion that for the present it ought not to require the discontinuance of some minimum charge.

If such a charge is to be permitted, its amount is a matter of expediency respecting which the Board is not inclined to interfere, unless the manner of its imposition tends to work a real hardship upon small customers, and so become a palpable evasion of the company's public duty. Respecting the present charge, the Board is convinced that no increase in amount should be allowed, and that a smaller amount might be desirable.

If the company shall continue to impose a minimum monthly charge upon its customers who pay the prevailing maximum net price, such charge shall not exceed $1 per month per meter; and if on any thirtieth day of June it shall appear that a customer has, by reason of said charge, paid or become liable to pay during the year immediately preceding an amount exceeeding the minimum monthly charge multiplied by the number of months in which he has been a customer, and an average price for electricity supplied by meter exceeeding the prevailing maximum net price per kilowatt hour, the company shall refund all such excess; provided, however, that nothing in this recommendation shall be construed to require the company to render its service at an average charge per month less than the minimum monthly charge, or at an average price per kilowatt hour less than the prevailing maximum net rate.

Edison El. Ill. Co. of Boston.....Mass. G. & E. R., 1910 40, 41, 42

With respect to the minimum monthly charges for gas and electric lighting, the money value of these charges is not important to the company. No such charge had been made by the former management. The company had been, and would probably continue to be prosperous without it. It is supported by the claim that the readiness of the company to supply, is a convenience to the customer, and a service which has value even though he may not actually use the light, and that such service is of some cost to the company, which ought not to be required to render any service at a loss. . . . It may, indeed, be impossible to determine it in any individual case. If any such charge is to be made its amount must, therefore, be determined somewhat arbitrarily with reference to

other considerations rather than its cost. While it is doubtless true that any public service company may sometimes be legally and reasonably required to render certain services without a demonstrable profit, or even at less than the apparent cost, to require a company to give any service continuously or repeatedly at an obvious loss would be manifestly unjust and inexpedient.

North Adams Gas Light Co.....Mass. G. & E. R., 1912, 22

MISSOURI.

The defendant then, apart from the contract had a right to fix a fair and reasonable minimum charge, to compensate it for necessary expense and service in inspecting meter, for service used in a quantity not provided for by the contract.

76 Mo. Appl. 540.

MISSOURI SUPREME COURT.

The evident purpose of this rule was to exact fair compensation from those requiring gas connection, and gas furnished at hand, though the amount consumed should be very small, almost nominal. We think it is not unjust or unreasonable. It is a matter of common knowledge, that to furnish gas at hand for a very small or nominal consumer, requires the same outlay, in the way of a meter, periodical inspection and repairs, with weekly or monthly visitations, that is required of very large consumers. The same investment, and the same care and oversight, is required where the gas monthly consumed shall not exceed ten cubic feet, or even one cubic foot, as where the amount used may be ten thousand cubic feet. At the rate charged then in Sedalia, . . . the gas company would be required to invest and expend, for the benefit of this merely nominal consumer, more dollars than cents received. . . . We hold, then, that the rule or regulation in question, . . . is not as a matter of law unreasonable.

State ex rel. v. Sedalia Gas Light Co.....34 Mo. Appl. 501

MISSOURI.

THE ST. LOUIS PUBLIC SERVICE COMMISSION, MISSOURI.

In the Report of the St. Louis Public Service Commission to the Municipal Assembly, on Rates for Electric Light and Power, 1911, is given a thorough analysis of the cost of service, which is the basis of the schedule of rates recommended therein, and the report upholds a "cost to serve" charge as distinct from the consumption charge, as equitable and just. p. 3, p. 81, and Appendix p. 13, p. 20, 21.

Conclusions stated are

Customers' Charge is an exceedingly important factor in establishing residence rates, and items admitted to the charge need to be closely scrutinized.

As the calculation of the maximum rate takes into account the full amount of the customers' charge, the present custom of requiring a minimum bill of one dollar per month should not be allowed to continue where the consumer pays the maximum rate, but in order to protect the consumer and the company against the possible addition of large numbers of customers who might require connection simply for occasional use of the current, the Commission believes that a minimum bill of fifty cents per month should be required of the consumers paying the maximum rate. In all other cases a minimum bill of one dollar is considered just.

NEW JERSEY BOARD OF PUBLIC UTILITIES.

Lighting Service.

The conclusions of the Board therefore are:

First. That the exaction of a minimum charge is a reasonable rule or regulation for an electric lighting company to make;

Second. That the making of this charge by the month is just and reasonable, and is really more equitable than if the charge were made by the year;

Third. That a charge of $1 per month 'per plant for installation' is just and reasonable, but that a charge of $1 per meter is excesssive where more than one meter is installed. A minimum charge of 50c per month per meter, however, is not excessive or unreasonable, for each additional meter installed on the same premises, for the same customer, supplied through the same service;

Fourth. That where a customer requests that service be discontinued for a period of at least one month or more, the minimum charge should be waived during such period;

Fifth. That where a customer requires the service for a limited period only, a reasonable charge may be made for the work of connecting and disconnecting the service at the beginning and end of the short period;

The minimum charge is part of the rate schedule, and should be incorporated with it whenever it is compiled for examination by the public.

Memorandum in re Minimum Monthly Charge.....N. J. B. P. U. Jan. 16, 1912.

Power Service.

From this comparison it does not appear that a minimum charge of 50 cents per horse-power per month is excessive or unreasonable. It is undoubtedly true that the exaction of a minimum charge will result in an apparent hardship to a small number of customers who use their equipment but a very short time, in some cases not more than four or

five hours per month. The fact must not be lost sight of, however, that the supply of electric power is strictly a commercial proposition, and to relieve one customer from the payment of any considerable portion of the cost would merely result in transferring the burden to other customers, and such a transfer does not appear to be justified.

The Board, therefore, determines that in connection with the furnishing of electricity for power purposes, the exaction by a company furnishing such service of a minimum charge at the rate of 50 cents per horsepower per month is not excessive or unreasonable. The Board further determines that the smallest minimum charge now made in connection with electric power service, which is $1 per month, is likewise not excesssive or unreasonable.

Memorandum in re Minimum Monthly Charge.....N. J. B. P. U. Jan. 16, 1912

It is pretty generally agreed today, that a properly constructed schedule of gas rates, will combine two different kinds of charges, a minimum charge, and a charge graduated by consumption. A gas company has two different kinds of expense. The first, consists of the charges arising from having built, and having to maintain, a plant and delivery system. This charge, is largely independent of the quantity of gas consumed. It would exist, if no gas at all were consumed for a time. The other kind of charges, for fuel, labor, etc., will vary, largely with the total product manufactured and delivered. A fair minimum guarantees a return on plant built, maintained, and held in readiness to serve. A fair charge for the amount of gas consumed, affords a return for the second class of expenses. A proper schedule will combine both minimum charge, and a metered consumption charge, and is fairer, and more advantageous, in the long run, to both consumer and producer, than the ordinance provision now operative in Ocean City.

Ocean City Gas Light Co.....N. J. B. P. U. July 19, 1912

NEW YORK SUPREME COURT.

The law does not contemplate that the defendant shall do business at a loss. It is expected that it will, and it is entitled to, make a reasonable profit upon its venture, and the sole question in such a case as this is, whether the charge made is unreasonable, considering all that the defendant is required to do, to meet each customer's demand. . . The customer does not bind himself to use any particular amount of light, so that the return to the company, based on actual consumption, would rest entirely upon his volition, and it would therefore depend upon him whether the service he has required the corporation to be in constant and immediate readiness to render, is profitable or unprofitable to the latter. But this constant condition of readiness is a necessary and unavoidable

obligation, which must be sustained, in order to meet instantaneously the demand for light, which the consumer is entitled to have at any moment that he wishes it. It thus forms a part of the service to be rendered, and is an item properly to be considered when the reasonableness of the charges exacted by the company is called in question. . . . They are free to exact a reasonable return for the service required, which includes, as I have said, not only the actual supply of electric light, but the readiness to supply it. . . . One consumer with the same number of lamps will use more than another. In both cases the return to the company may be remunerative, or the use of one may be so inconsiderable as to involve a loss. To meet this contingency the monthly minimum charge of $1.50 is made. But it must be borne in mind that this payment is not in addition to the charge for actual consumption. Where light is consumed which entitled the company to payment, on meter measurement, of a sum per month equal to, or in excess of the so-called minimum charge, the customer pays only for the light he has actually had; so that this fixed charge becomes practically operative only where his consumption falls below the extent of use which it measures. I can see nothing unreasonable in this, when the service, as I have defined it, which the company is obliged to render, is considered. It is not a penalty for a failure to use defendant's product, but is properly to be regarded as compensatory for that part of the service, which is at all times being rendered, in the maintenance of the apparatus and connections through which the electric current is made available to the customer for the production of light at his pleasure.

Gould v. Edison Electric Illuminating Co. of New York. .60 N. Y. Supplement 559

OHIO.

Nothing in this act shall be taken to prohibit a public utility from . . . providing for a minimum charge for service to be rendered, unless such minimum charge is made or prohibited by the terms of the franchise, grant or ordinance under which such public utility is operated.

Ohio Laws, 1911.....No. 325, Sec. 19

TENNESSEE.

We do not think it can be reasonably contended that it is not competent to charge a minimum rate. We think it is clear from the authorities that the company had a right to fix a fair and reasonable minimum charge for water supplied to any particular resident.

Tenn. Chancery case 8368.

WASHINGTON.

The Second Annual Report of the Public Service Commission gives the following ruling, p. 83:

> As to the first contention, the Commission is of the opinion that the imposition of a reasonable minimum charge is a reasonable practice which tends to equitably distribute the cost of operating and maintaining the plant, among all patrons, who, by reason of their service connections, are in a position to make demand upon the company for service. The practice of collecting a minimum charge of this character is sanctioned by custom and authority, and is followed by the City of Seattle with respect to its municipally-owned water and lighting systems.

Seattle Light Company.....Washington P. S. C. No. 683, Nov. 16, 1912.

WISCONSIN RAILROAD COMMISSION.

The following rulings are taken from the Index-Digest of the Wisconsin Railroad Commission Reports, Vol. V, p. 870, and Vol. VI, p. 828:

> The primary purpose of the minimum bill is not to yield any considerable increase in revenue. Its purpose is rather to enable the utility furnishing service to receive from each consumer an amount at least equal to the cost to the utility of being prepared to furnish service.

In re Appl. Lancaster El. Lt. Co., 1910.....6 W. R. C. R. 53, 57

> In addition to covering the cost to the utility of being prepared to furnish service, it is the general rule that the minimum bill should be placed high enough to return to the company payment for current actually used.

In re Appl. Lancaster El. Lt. Co., 1910.....6 W. R. C. R. 53, 57

> Application was made by the Lancaster El. Lt. Co. for authority to put in effect a minimum rate of $1 per month for electric current at Lancaster, Wisc. An analysis of the operating expenses shows that the consumer costs to the company amount to 46 cents per meter per month. In addition to this amount, if a consumer used two kilowatt hours per month, the value of current used at the rate charged by the applicant, 12½ cents per kilowatt hour, would be 25 cents per month. The minimum bill, therefore, . . . must be high enough to cover these fixed costs and also the average value of current used by the class of consumers who, in general, use the smallest amount of current. . . . Under the circumstances, the proposed minimum of $1 per month would be unnecessarily high, and a minimum monthly bill of 75 cents would be reasonable and just. The applicant is authorized to put such a minimum rate into effect.

In re Appl. Lancaster El. Lt. Co., 1910....6 W. R. C. R. 53, 57-59

As repeatedly stated by this Commission, the minimum bill rests, for its justification, upon certain expenses which are incurred by a utility because of its being in a position to serve. In other words, the minimum bill for an electric lighting utility may be greater than the amount which would be derived from the consumer in question if he were charged merely for the current used at regular rates, and this is due to the fact that the utility incurs certain expenses because of its readiness to furnish current to the consumer, irrespective of whether or not he actually uses current. These expenses are such as arise because of the consumer's premises being connected to the lines of the utility, and may be determined with a considerable degree of accuracy.

In re Appl. Greenwood Mun. Lt. Plant, 1910...6 W. R. C. R. 60, 61

The minimum charge should yield a return equal to the consumer cost, and an additional amount to cover the value of the smallest amount of current used by any class of consumers.

In re Appl. Greenwood Mun. Lt. Plant, 1910...6 W. R. C. R. 60, 62

The question of the effect of the minimum charge on the revenues of the utility is not of first importance in determining the reasonableness of such a charge. The main purpose of the minimum charge is rather to make it certain that each consumer bears his just share of the expenses incurred in supplying service.

In re Appl. Greenwood Mun. Lt. Plant, 1910...6 W. R. C. R. 60, 63

As regards the justice of a minimum bill provision, this Commission has expressed itself fully in several previous decisions, and it does not appear necessary to go into the matter in any detail. It does appear, that the facts as regards the so-called 'consumer' costs, and other expenses, properly considered in connection with the establishment of a fair and reasonable minimum charge, as they have been discovered in this case, make it conclusive that a monthly charge of 50 cents per consumer is both fair and reasonable to both the consumers and the utility in the present case. This minimum must be charged against each consumer, irrespective of whether the consumer or the utility owns the meter.

In re Appl. Bloomer El. Lt. Plant, 1911....6 W. R. C. R. 506, 517

The operating expense of an electric plant includes several items which vary with or are proportional to the number of metered consumers. The expense of reading meters, maintaining meters, delivering bills, and carrying the customers' accounts, are expenses which bear little or no relation to the current sold. These costs go on month by month, whether the consumers use much or little current. Interest, taxes and depreciation on the investment represented in the meter, are expenses which the plant must bear and which it rightly expects to have returned to it. By adding the direct

consumer expenses to the fixed charges on the meter investment, and also making a sufficient allowance for the current which will be consumed under the minimum bill, the minimum charge may be definitely determined.

City of Manitowoc v. Manitowoc El. Lt. Co., 1910....5 W. R. C. R. 360, 389-390

In the final classification of operating expenses there appear items of expenses which, strictly, do not vary with the output of electricity, nor are they capacity expenses in the sense previously used. Such expenses vary with the number of metered consumers, since they are incurred through the customer being connected with the plant, and specific expenses being incurred on his account. The expenses of reading meters, maintaining meters and other meter expenses, delivering bills, carrying the customers' accounts, are examples of the items in question. Under a schedule of flat rates, even though encouraging waste, the utility is guaranteed a specific income, which is profitable only where each consumer is reasonable in the use of the privilege afforded. Under meter rates, revenue is available only when current is used, and it is a common experience that many customers do not use sufficient current to incur a bill large enough to meet the fixed expenses alone. A minimum bill, therefore, is both necessary and just.

(City of Ripon v. Ripon Light & Water Co., 1910....5 W. R. C. R. 1, 41)

In re Appl. Jefferson Municipal El. Lt. & W. Plant...5 W. R. C. R. 555, 574

Professor Bruce Wyman, of Harvard University, one of the foremost authorities in this country on the subject, in his standard work, The Special Law Governing Public Service Corporations and All Others Engaged in Public Employment, says, p. 1104, 1106, paragraphs 1248, 1251:

Indeed, in every service there is a certain constant expense in each individual service, which justifies a relatively high minimum charge for any service at all, but becomes relatively inconsiderable as the service rendered increases in amount. This is peculiarly true of such separated services as the domestic services. Every householder that the service company equips itself to supply with water, gas, electricity, or telephonic connection involves not only a very considerable additional capital charge, but a very considerable regular expense. It is therefore altogether justifiable for the company to protect itself against this cost by the establishment of a minimum charge. This principle is carried to its logical extreme by some electric lighting companies which base the consumer's rate upon his maximum takings on the theory that the installation required is the proper basis.

Objection has previously been taken to the making of a charge for equipment employed, such as meter rent. It is believed that a public service company ought to provide all the facilities necessary for rendering the service it undertakes, and upon its total investment therein base its general rates. In accordance with this theory, meter rent as a charge for facilities furnished should never be charged. But many supply companies term the price which they require their customers to pay at all events "meter rent," when upon the whole facts, it is really a minimum charge; and many courts, in permitting the charging of such meter rent, are really on the facts only justifying a minimum charge. It is therefore necessary to make the distinction between what is truly a meter rent, and what is really a minimum charge very carefully. A dollar meter charge would be added to each bill regardless of consumption; the dollar minimum charge would only be made if actual consumption was below that amount, while if it was above, the actual measurement would alone be charged. Therefore, while an equipment charge is essentially wrong (and is indeed so regarded by most authorities which have had this distinction called to their attention), a minimum charge is essentially right. The one makes a charge for the provision of facilities as such, which is wrong; the other is designed to compensate for the essential costs of small service, which is right.

NEW ENGLAND RATE COMMITTEE

6—Rate Practice

The Chairman of the Committee on Rates of the New England Section of the National Electric Light Association, Mr. R. S. Hale, has called a meeting of the Committee for January 24th, with the purpose of working out the various questions as to rate practice along the same lines as those followed by the National Rate Research Committee. The special interest pointed out by the Chairman for the attention of the Commitee is the subject of a standard form of rate schedules, as recommended by the Rate Research Committee at the Seattle Convention, 1912.

The membership of the Committee is as follows

R. S. Hale, Edison Elec. Illum. Co., of Boston, Chairman.
W. S Wyman, Central Maine Power Co., Augusta, Maine.
H. D. Larrabee, Consolidated Lighting Co., Montpelier, Vt.
W. G. Meloon, Twin State Gas & Electric Co., Dover, N. H.
Walter Schwabe, Northern Connecticut Lt. & Pr. Co., Windsor Locks, Conn.
Jesse E. Gray, Narragansett Elec. Lt. Co., Providence, R I.

RATE REFERENCES

129—Default in Public Service—Discrimination

Complaint against the Granville Electric and Gas Company of Granville (pop. 3,920), New York, charging that rates for electricity and gas are unreasonable. Decision of Public Service Commission (2nd D., N. Y., adjusting rates.

The opinion in the matters was prepared by Commissioner Martin S. Decker, and holds that the evidence as presented in the case discloses the company has been discriminating between its residence and business lighting. The opinion further states:

> No reason appears why it should maintain a higher rate for house service, and accordingly its 15-cent rate for residences should be reduced to 13 cents per kilowatt hour. It should also reduce its residence rate for larger quantities to correspond with its business rates. In other words, its residence and business rates for like quantities used would be the same. This ruling applies only to the fact and conditions shown in this case, and may or may not be applicable in other cases, being dependent upon the particular facts appearing herein.

2—Public Service Regulation—Ohio

Decision of the Public Service Commission of Ohio, adjusting rates of Middletown Gas and Electric Company. Electrical World, Jan. 11, 1913, p. 86.

The Public Service Commission of Ohio has ordered the Gas and Electric Company, Middletown (pop. 13,152) to amend its long-hour lighting and breakdown lighting rate, and to substitute instead two rates, one relative to long-hour lighting, to be the same as that now in force, and the other relative to breakdown service to be as follows:

Demand Charge

$3.00 per month per kilowatt of demand.

Energy Charge

10	cents	per	kilowatt-hour	for	first	150	kilowatt-hours	per	month.
9	"	"	"	"	"	next	150	"	"	"	"
8	"	"	"	"	"	"	300	"	"	"	"
7	"	"	"	"	"	excess over	600	"	"	"	"

223—Rates—Regulation

Establishment and Change of Rates, a 154-page pamphlet, issued by the Department on Regulation of the National Civic Federation, is the sixth to appear in its series compilation of public utilities regulation laws of the United States.

This gives, under nine main headings, the powers conferred on the commissions in the different states, to regulate, supervise, or enforce rates and charges of public service corporations.

482—Daylight Schedule

VARIATION OF RESIDENTIAL LIGHTING WITH THE SEASON, Electrical Review, Jan. 11, 1913, p. 88.

Gives an interesting graphic chart, used by the Commonwealth Edison Company of Chicago, as an advertisement, which shows in a striking manner the amounts of current required for residence lighting during the different months of the year, varying from an average of 2.55 hours in June, to 6.85 hours in December.

62—Character of Service

ELECTRICAL REFRIGERATION FOR THE BUTCHER, Illustrated article, Electrical Review, 5½ pages, Jan. 11, 1913, p. 83.

Gives data from refrigerating plants in meat shops, showing from the use of artificial refrigeration in place of ice, a gain not only in the matter of expense for maintaining a lower temperature, but also through the saving due to the elimination of frequent trimming. The latter saving often pays the cost of the power. Automatic control aids in keeping the temperature constant.

69—Rate Schedules

RATES OF PUBLIC UTILITIES IN WISCONSIN, Part 1, ELECTRIC RATES, A COMPILATION OF RATES IN FORCE JUNE 1, 1912. A pamphlet of 234 pages, published by the WISCONSIN RAILROAD COMMISSION, MADISON, WIS., 1912.

The schedules of rates as here presented have been compiled from the official rates as filed by each electrical utility in the State of Wisconsin with the Commission, and the classification of the rates is as prescribed in the Commission's uniform classification of accounts

An introductory statement gives the rules governing the standards for electric service established in 1908, which are still in force, and mentions that a number of modifications have been made by the Commission where conformity to the uniform standards resulted in unwarranted burden to the public utility, or to the consumer, or to both.

69—Rate Schedules

LUCID RATE SCHEDULES, editorial, Electrical World, Jan. 11, 1913, p. 77.

States that it is of the first importance to public utility companies to establish relations of confidence and respect with their customers, and that one of the essentials for this is to have rate schedules in a simple and easily understood form, with the necessary explanations of them in clean-cut wording.

69—Rate Schedules

REDUCTION OF RATES IN ST. LOUIS, Electrical World, Jan. 11, 1913, p. 98.

Following its reduction of rates effective on Dec. 1, 1912, the Union Electric Light & Power Company of St. Louis, has offered its commercial customers another optional schedule. During the month of December about 7,000 responses were received. In about 90 per cent of these cases the consumer has been materially benefited by the new rates. The matter has been handled in this way because there are several different schedules, and the customer's consumption is taken for a year, and figured on the basis of the various schedules to ascertain which is the most beneficial to him. The company announces that it will continue its policy of rate reductions from time to time as conditions warrant, and patrons will always have the benefit of these reductions regardless of existing agreements.

INVESTMENT AND RETURN—REFERENCES

2—Public Service Regulation

THE NEW JERSEY GAS DECISIONS, editorial and article, Electric Railway Journal, Jan. 11, p. 55, and p. 80.

States that undoubtedly one of the most important matters to be settled during the next few years, concerning both public service companies and the public, is this question of the proper basis for the valuation of public utility properties for rate-making purposes, and that after all, the final word in the matter will have to be pronounced by the highest court in the land, until when the financial status of new capital in such enterprises will be uncertain, and investors will be unwilling to risk much money in public utilities. The Public Service Gas Company has accepted the rate established by the board, but has reserved the right to test at its convenience, the legality and constitutionality of the board's valuation of its property.

2—Public Service Regulation

Suggests Public Service Commission for Washington, D. C., Electrical Review, 1/3 page, Jan. 11, 1913, p. 109.

A bill was introduced into the House of Representatives on December 7, 1912, reducing the maximum price of electric current sold in the District of Columbia from ten cents per kilowatt hour to five cents. The Commissioners of the District of Columbia have disapproved of this reduction, and recommended adverse action on the bill, stating their reason as follows:

> The Commissioners have not the necessary data, nor under present law have they authority to obtain the necessary data, to ascertain whether the present maximum rate of ten cents per kilowatt hour, charged for furnishing electric current, should be reduced. It was because of their inability to handle such matters, that they have recommended to Congress the establishment of a public utilities commission, a bill for which has already passed the Senate and is now pending before your Committee. If this bill, or a similar bill, is enacted it would confer upon the Commissioners the authority of a public utilities commission, and with the powers therein set forth would enable the Commissioners to determine whether the present rates charged for electric current in the District of Columbia are excessive, and should be reduced as is proposed in this bill.

2—Public Service Regulation

PUBLIC SERVICE GAS COMPANY RATE CASE, by Frank Bergen, General Counsel, Public Service Corporation of New Jersey, Aera, 19 pages, January, 1913, p. 465.

This is a summary of the brief for the Public Service Gas Company, mentioned in 2 R. R. 91, and is a strong presentation of the company's side of the case, the decision of which, by the New Jersey Board of Public Utilities, was abstracted in last week's issue of RATE RESEARCH.

2—Public Service Regulation

MESSAGES AND RECOMMENDATIONS OF THE GOVERNORS ON PUBLIC UTILITIES, Electric Railway Journal, 2 pages, Jan. 11, 1913, p. 74, and Electrical World, 1 page, Jan. 11, 1913, p. 83.

These articles give extracts from messages of governors of eight states, discussing public service regulation, with their comments and recommendations on the legislation along this line.

313—Prices

PRICES OF ENGINEERING MATERIALS, A Review and A Prophecy, Engineering News, 6 pages, Jan. 9, 1913, p. 93.

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RATE RESEARCH

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Rate Research

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Rate Research

Vol. 2. CHICAGO, JANUARY 22, 1913 No. 17

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

JANUARY MEETING OF THE RATE RESEARCH COMMITTEE.

The meeting of the Rate Research Committee was held in Cleveland, Ohio, on January 10th and 11th, 1913. Those present were Messrs. E. W. Lloyd, Chairman, S. E. Doane, R. S. Hale, L. H. Conklin, Edwin Gruhl, W. H. Winslow, Frank W. Smith and William J. Norton, Secretary.

Jurisdiction of the Committee. A resolution was passed definitely limiting the jurisdiction of the Rate Research Committee to questions of electric rates, and the Secretary was instructed to refer all questions upon investment and return, or upon rate regulation, to the Public Policy Committee for advice. The Committee, however, considered that investment and return and rate regulation were so important that it recommended to the Public Policy Committee that a permanent bureau be established to help Member Companies upon these important subjects.

Definitions. The Committee decided to revise the definitions of rate terms adopted in its last report.

1913 Report. Tentative plans were made for the 1913 Report of the Committee, and it was decided that this report should contain revised rate definitions, suggested forms of application for service, terms and conditions, contract riders, together with a complete analysis of many of the important existing rate schedules of Member Companies, and a comparison of such schedules with the schedule form adopted by the Rate Research Committee.

Next Meeting. The next meeting of the Committee will be held at Association headquarters, New York City, on Thursday, March 6.

NOTE.—The Committee will continue to publish in Rate Research, however, opinions and decisions relative to Investment and Return, and Regulation, but under a distinctive heading.

EDITORIAL NOTE.—All indented matter is direct quotation.

RATES
RATE REFERENCES

629—Breakdown Service

A paragraph was omitted in the reference in 2 Rate Research 250, to the decision of the Public Service Commission of Ohio, adjusting the rates of the Middletown Gas & Electric Company. The rate ordered for breakdown lighting service is, first, for demand a

Minimum Charge

$3.00 per month per kilo-volt-ampere of demand.

For energy used no charge will be made except for that amounting, for the month, at the specified rates, to more than the amount of the minimum charge. This energy charge is:

10	cents	per	kilowatt-hour	for	first	150	kilowatt hours	per	month		
9	"	"	"	"	next	150	"	"	"	"	
8	"	"	"	"	"	300	"	"	"	"	
7	"	"	"	"	excess over	600	"	"	"	"	

62—Character of Service

Electrical Drive of Kettles in Plaster Mills, by A. E. Anderson, illustrated article, Electrical Review, 2 pages, Jan. 18, 1913, p. 131.

Gives data and information from tests, on power requirements of plaster plants, with tables of kilowatt hours used for tons of plaster produced, and the load curve.

62—Character of Service

Readiness to Serve Methods; Modernizing the House, by Ross B. Mateer, Journal of Electricity, Power and Gas, 1½ pages, Jan. 11, 1913, p. 44.

Gives operating costs, obtained by tests recently completed, of various electrical appliances for the comfort and convenience of the home, especially in rural regions of California, including illumination, toasters, percolators, heaters, washing machines, etc.

755—Accuracy of Meters, Tests and Inspections

Tentative Rules of Electric Service and of Gas Service.

These rules covering meters, and meter-testing equipment and practice, have been formulated by the Wisconsin Railroad Commission, and submitted to a joint conference of representatives of the electric and gas companies of Wisconsin, and the experts of the engineering staff of the Commission, for discussion preliminary to adoption as a revision of the rules issued in the Commission's decision in the matter of Standards for Gas and Electric Service, of July 24, 1908.

REGULATION

COMMISSION DECISIONS—NEW YORK

132—Protection of the Corporation from Competition

In the matter of the Petition of Oswego River Power Transmission Company of Syracuse, N. Y., for permission to begin construction, and exercise rights and privileges under franchise granted by the City of Fulton. Decision of Public Service Commission (2nd D., N. Y.) denying the petition. April 9, 1912.

The following paragraphs show the grounds of the decision:

> The petitioner has a franchise from the City of Fulton, purchased by it at public sale on the 9th day of March, 1911, and for which it paid the City of Fulton the sum of $2,000 . . .
>
> It does not produce electricity, but purchases it from the Niagara, Lockport and Ontario Power Company . . .
>
> Under the terms of this franchise the City of Fulton is to have the free use of any poles erected and one duct in any subway constructed for the purpose of carrying the wires of its fire alarm system and its police alarm system. The grantee in said franchise also agrees to furnish free to the City of Fulton at the city hall, fire department buildings, police station, hospital, public library, and office of the public works, electricity for lighting purposes as may be reasonably necessary. It also agrees that its maximum rate to be charged for electricity for lighting purposes shall be eight cents per kilowatt hour where sold on a kilowatt hour basis, with a discount of ten per cent if paid on or before the tenth of the month following that in which electricity is delivered, with a minimum charge of fifty cents a month. It further agrees, if requested to do so, to furnish to the City of Fulton all electricity which the city may require for lighting the city streets at the price of one cent per kilowatt hour, such electricity to be delivered and measured on the switchboard of the Oswego Company in the City of Fulton. . . .
>
> The petitioner states that if it is allowed to exercise its franchise and distribute electricity in the City of Fulton it will reduce the price of current to lighting consumers. . . .
>
> The principal reason, however, advanced by the petitioner in support of its petition is this: It claims that there is at the present time a large demand for power in the City of Fulton which the Fulton Company (the objector), as petitioner claims, has not in the past been able to fill, and which it is not at the present time in a position to supply. The Fulton Company denies this statement, and alleges that there is no demand for power in the City of Fulton at this time which it is not able and willing to supply upon reasonable terms. . . .

The Commission is, however, confronted by the proposition of the applicant to furnish to the residents of Fulton commercial lighting at a lower price than that charged by the company now serving them. This is a matter which requires clear analysis and careful consideration. . . .

Generally speaking, it is to the interest of a community to obtain electric current for lighting at the lowest rate which may be offered, and such is the usually accepted view. Like all general statements, this requires both amplification and modification. First, as to time. An abnormally low rate which can be maintained only for a brief period, and that at a loss to the seller, must eventually result in a state of affairs demoralizing to the service, unsatisfactory to everyone, followed by a rise in rate which will be fixed, if possible, to recoup to some extent past losses as well as to compensate for present service. It is for the advantage of all that service should at all times be kept up to the best possible condition of efficiency, that the rate should be steady and uniform, with such reductions from time to time as improvements in the art, increased density of traffic, and time extension of load may justify and require. The temporary low rates occasioned by cut-throat competition have no justification. We are justified in saying that a rate so low that it cannot be maintained is not desirable because of the results it entails. The general statement must be amplified so as to cover a reasonable time element and modified so as not to lose sight of the character of the service given during such time.

The mere offer by an applicant seeking to enter a territory already served by another company to reduce rates is insufficient standing wholly alone to justify authorization to make such entrance without further inquiry as to the adequacy of the rate to afford continuous high class service, and as to the ability of the company already serving the territory to reduce its rates to meet those proposed. If the existing rate is unreasonable, the Commission has the power to reduce it. If the proposed rate is not adequate to maintain the service at the proper standard and yield some return upon the investment, it should not be considered. If the applicant can afford to give the lower rate and maintain the standard of service, and the company serving the public cannot do so, then the right of the public to the lower rate is paramount and other considerations must give way. The progress of the world is dependent upon this principle. . . .

The practice of the Commission in a situation such as is here presented has been fully stated in the case of the application of the Niagara Falls Lighting Company decided July 1, 1909. The decisions of the Commission in analogous cases are there reviewed in detail, and it is unnecessary to repeat them here. It is there stated that the "policy of this Commission in cases where one

lighting company seeks to enter a field already occupied by another, requires that the applicant shall show that the company already serving the community is not doing so adequately and efficiently and that its failures are such that they cannot well be corrected by the exercise of the regulative powers of the Commission. Good service may now be obtained at reasonable prices in less expensive ways than by unnecessary duplication of plants, and the public interest does not demand that capital invested in good faith in the public service should be destroyed or impaired without good reasons to be shown affirmatively."

Under the principle here set forth the Commission must hold that the company now occupying the field, whatever may have been its shortcomings in the past, should be given an opportunity with its present equipment to meet the demand for power which is clearly proved to exist.

The Oswego Company had previously erected a transmission line along the berme bank of the Oswego Canal, under a permit from the State Superintendent of Public Works, and has continued to deliver electricity to the Victoria Paper Mills, located within the limits of the city of Fulton. The Fulton Company then brought another complaint, asking the Commission to enjoin the Oswego Company from doing any electrical business in the territory of Fulton.

The Commission after a hearing, in its decision, December 3, 1912, holds that the permit issued by the State Superintendent of Public Works is a franchise, which can not be lawfully exercised without the approval of the Commission, and orders the Oswego Company to show cause why it should not be compelled to discontinue service of electricity in Fulton.

2— PUBLIC SERVICE REGULATION IN THE VARIOUS STATES.

To complete the information compiled in 2 R. R. 223, of the status of public utility regulation in the different states, mention may be made of the following,

States which have neither railroad nor public utility commissions.

DELAWARE

The Laws of 1911, c. 206 provide for a Board of Public Utilities Commissioners for the City of Wilmington.

DISTRICT OF COLUMBIA

Several bills have been introduced in the 62nd Congress providing for a utility commission for the District of Columbia. Such a bill is now pending, and President Taft, in his recent message to Congress, has strongly urged its passage.

IDAHO

No regulation of any utility.

UTAH

No regulation of any utility.

WEST VIRGINIA

No Commission regulating utilities, but the matter is now being considered, and a bill providing for a public service commission will probably be introduced in the coming Legislature.

WYOMING

No regulation of any utility.

COURT DECISIONS—NEW YORK

132—Protection of the Corporation from Competition

The People ex rel. The New York Edison Company, Appellant, v. William P. Willcox and others, constituting the Public Service Commission in and for the First District, and the Long Acre Electric Light and Power Company, Respondents. Decision of the New York Court of Appeals, Jan. 2, 1913.

The Long Acre Company was incorporated April 23, 1903, having become the assignee of an earlier company holding a franchise from the Board of Aldermen of the City of New York of May 31, 1887, granting permission to erect poles and wires throughout the city for electrical purposes; and in February, 1908, petitioned the Commission for authority for an issue of stock and bonds. This was refused upon the ground, among others, that no authority to begin construction had been obtained from the Commission, whose jurisdiction dated from July 1, 1907, or its predecessor, the Commission of Gas and Electricity; but the Appellate Division, upon a review under a writ of certiorari, reversed the order by a divided vote, and ordered that the application be referred back to the Commission, which thereupon, after hearing, at which the New York Edison Company was allowed to produce evidence in its own behalf, authorized the issuance of stock and bonds, by the Long Acre Company. The Edison Company then obtained a writ of certiorari for the review of the Commission's decision, which resulted in the authorization being affirmed by the Appellate Division, from which the Edison Company appealed, and the present decision by the Court of Appeals of New York, reverses the order and affirmance, and gives judgment in favor of the Edison Company.

It should be noted then that this decision of the matter is in accord with the original action of the Commission in denying the Long Acre Company's petition.

Significant paragraphs from the decision are:

The Public Service Commissions law was enacted, in response to a pronounced and insistent public opinion, and was a radical and important modification of the relations and policy of the people toward the corporations which are its subjects. Its paramount purpose was to protect and enforce the rights of the public. It made the commissions the guardians of the public by enabling them to prevent the issue of stock and bonds for other than statutory purposes or in appreciable and unfair excess of the value of the assets securing them, and to prevent also unneeded or extortionate competition, or indifferent and unaccommodating methods of operation or oppressive or discriminating charges or rates. It provided for a regulation and control which were intended to prevent, on the one hand, the evils of an unrestricted right of competition and, on the other hand, the abuses of monopoly. (People ex rel. D. & H. Co. v. Stevens, 197 N. Y. 1.) The purpose and intent of the law forbids the commissions to authorize the issue of stock and bonds under Sections 69 or 55, when prescribed requirements and conditions precedent to the right of the applicant to construct and operate a plant and system or a railroad, have not been fulfilled or complied with, and when, perhaps, the property to be acquired or constructed may never be acquired or constructed, and the bonds or stock, the issue of which is applied for, have no substantial security to rest upon. A contrary conclusion would make the authorization and avouchment of the commissions a bait and a trap for ensnaring the investing public. . . .

The Edison Company was and for many years had been furnishing electricity for light, heat and power in the boroughs of Manhattan and The Bronx. It was directly and seriously interested in this proceeding which thus involved the consideration and determination of the present right of the respondent to place wires for those uses in those boroughs or acquire property or construct a plant to be used in competition with it. The Commission might legally and justly permit it to become a party to the proceeding and the determination adverse to it after its intervention was reviewable, under certiorari, upon its application as the party aggrieved thereby. . . .

The certificate of public convenience and necessity is to be granted upon considerations, not alone bearing upon the convenience of the public, but affecting the other transportation companies, which are already serving the territory. They have the right to be considered and to be protected, where there is no necessity for a wider public service, against the designs of persons more interested in forcing terms from them than in subserving the public convenience. Certainly the rights of the shareholders in the existing roads demand fair consideration. . . .

The Commission in the first decision adopted the construction that the respondent could not begin the construction of its plant without first having obtained its permission and approval. The Appellate Division in reversal held that it could begin the construction because the franchise did not fall within the class of franchises "not heretofore actually exercised." . . .

It is the settled policy of the state arising through an extended and instructive experience, to withdraw the unrestricted right of competition beween corporations occupying through special consents or franchises the public streets and places and supplying the public with their products or utilities which are well-nigh necessities. . . .

This policy instigated and is embodied in the Public Service Commissions law, which was adopted in the interests and for the good of the people and should receive from the courts an activity and effect in aid of that policy within the fair and reasonable meaning of its provisions. . . .

The construction given Section 68 by the Appellate Division, as contrasted with that adopted by the Commission in its first order, thwarts the policy. . . .

A scrutiny of other sections of the law creates the conviction that it intends to bring under its restrictions and regulation, in so far as is lawful, the franchises, powers and rights of the corporations existing at its enactment, and to which it relates, and under the control of the commissions all construction of their plants.

INVESTMENT AND RETURN

COMMISSION DECISIONS—MARYLAND

2—Public Service Regulation—Maryland

Complaint against the Consolidated Gas, Electric Light and Power Company of Baltimore, as to the reasonableness of gas and electric rates. Decision of the Maryland Public Service Commission reducing the rates. Jan. 13, 1913.

The investigation of the rates for gas and electricity of the Consolidated Gas, Electric Light and Power Company of Baltimore, begun last July, has ended in a decision by the Commission reducing the maximum rate for gas from 90 cents net per thousand, to 80 cents, and the maximum rate for electricity from 10 cents per kilowatt hour, to 8½ cents, with minimum charge of $1.00 per month; the new rates to become effective July 1, 1913.

31—**Valuation**

The valuation adopted is that made by Ford, Bacon and Davis for the company, with a deduction of 50% of the amount claimed for overhead charges, and a deduction for depreciation as estimated by Professor Bemis, and the inclusion of $5,000,000 for easements.

Some of the main items ruled upon in the decision are:

112—**Franchises**

A subject of contention in the trial of the case was the valuation of the easements owned by the Company in the streets of Baltimore, and which, for the purposes of taxation, are assessed at $5,000,000. The counsel for complainants contended that the easement was in the nature of a franchise—in fact, grows out of the franchise—and as the law forbids the capitalization of franchises, it is not proper to include this value in a rate case, as an item upon which the Company should be permitted to earn a return, especially as no money was paid for it, and it does not represent actual investment.

Counsel for the Company contended, on the contrary, that the Court of Appeals having decided that the easement is real property, and a value of $5,000,000 having been placed upon it for the purpose of taxation, it was properly included in the assets of the Company, as property upon which it is entitled to earn a return. The matter was referred to the General Counsel of the Commission, who in a careful opinion filed in the case sustains the contention of the Company.

In the judgment of the Commission, the opinion of the General Counsel should prevail, but one of the members is not free from doubt on the subject. It is not deemed necessary to go into an extended discussion of it. Nor is it considered of special importance in determining prices, as it will be seen later that a definite amount of revenue is necessary.

33—**Capitalization**

On behalf of the complainants, it is contended that the capital of the Consolidated Gas, Electric Light and Power Company is greatly inflated; that a considerable part of it is not entitled to any return; that the company, inasmuch as it is getting a return upon inflated capital, is, therefore, earning too much money, and that a fair rate of return upon the fair value of its property does not justify the present charges for services, and they should be reduced. These contentions of the complainants are strenuously combated by the company.

It may be assumed as a fact in all corporate financing that the stock and bonds will exceed the physical value of the plant when

it is complete and ready for business and before the processes of depreciation have set in. This is necessarily so, because a number of legitimate outlays have been made which are properly chargeable to capital account, and in a case where it was evident that good business judgment and economy in construction were exercised, and that securities had been issued for actual value only, some intangible values could be allowed without exciting criticism. But it is apparent from the testimony in this case that such a condition does not prevail in the affairs of the respondent Company. For example, the Consolidated Gas Company of 1880 was a merger of the Gas Light Company of Baltimore . . . and the Peoples Gas Company . . . and the Consumers' Mutual Gas Light Company. . . . The combined capital (stock and bonds) of these companies at the time of the consolidation amounted to $8,300,000.00. Assuming that this amount of capital represented actual legitimate investment, it is inconceivable that the mere execution of the consolidation papers could have increased the investment in either tangible or intangible property values to the extent of $1,300,000.00. But it appears as a matter of fact from the statement of actual investment as shown by the books of the Company . . . that the physical value at that time was $4,776,922.00, which shows that the old securities exceeded the apparent investment by the sum of $3,523,078.00, or 73.75%. The apparent investment was less than 50% of the new securities. Even upon the assumption that the estimate of Ford, Bacon and Davis covered only the value of units installed, without allowance for overhead expenses, it is manifest that a considerable over-issue of securities had taken place before the consolidation, some part of which may, perhaps, be accounted for by discount on bonds and abandoned and obsolete property, of which, however, we have no record; and the over-issue was increased in the consolidation to the extent of $1,300,000.00.

The same conditions obtained in the subsequent consolidations of 1888, 1899 and 1905-6. The final result is that in adjusting the interests of the security-holders of the various companies there was an increase of $9,850,638, which does not represent actual investment in any form.

We realize that the problem, viewed from the financial standpoint, was a difficult one to solve, and it may be that under the conditions existing at the time, with no supervisory body to check the tendency to recoup losses through the increase of securities, and not so much as a hint of a legislative rule on the subject, over-capitalization was inevitable—and probably to the extent that it was thought the public patience would bear.

311—**Basis of Valuation**

Section 30 of the Public Service Commission law clothes the Commission with power to ascertain the fair value of property of any corporation subject to the provisions of the Act and used by it for the convenience of the public, and provides:

"Every such valuation shall be so made and ascertained by the Commission that as far as possible it shall not disturb the value of bonds of any of said corporations issued prior to this Act."

This provision is peculiar to the Maryland law and has no counterpart in any law for the regulation of public service corporations that has come to our knowledge. It is a positive direction, binding upon the Commission. The opposing contentions are, upon the part of the complainants, that "what the Legislature meant must have been not that the valuation but the rate of return should be such as not to disturb the payment of the interest": and on the part of the company that "as far as possible" the value of the bonds as property shall not be disturbed . . .

The opinion of the General Counsel, to whom the question was referred, sustains the company's contention, and in this view we fully concur. In addition to what the General Counsel says, it should be noted that the proviso is contained in the section of the law which provides for valuation alone, and could, therefore, have had no direct relation to either the rate of return or the rates for service.

34—**Rate of Return**

In the present case the practical question in this connection is: Can we assume the par value of the bonds to be the value of the property and establish a rate of return which will provide for the legitimate needs of the company and at the same time be reasonable to the public? Or (to reverse the proposition), can we take the ascertained value of the property and establish rates for service which will be just to the public and at the same time provide for the legitimate needs of the company? This is the problem for the Commission to solve.

The rate of return should, primarily, be based on the actual investment in the property, and should bear some relation to the rate of interest allowed by law, as that is the legislative standard by which the just return for borrowed money is fixed. In ordinary transactions, however, a fixed ratio is established which does not vary with the circumstances of the borrower, and assuming that the borrower is solvent the payment of the interest is certain. But in the case of public service corporations, whose revenues are subject to fluctuations, some latitude must be allowed so that the deficits of one year may be made good from the larger profits of another year, and pre-

serve an average return which will be fair and just, and attract capital for the extension and improvement of the corporations property.

The law of the State under which this Commission acts, has legalized the bonds of the Company issued prior to the Act, at least to the point of providing for the payment of interest upon them. The bonds issued since the consolidation, including those authorized by the Commission, . . . represent actual expenditures for extensions and improvements, and are not assailed in these proceedings. We think the return allowed should protect them, and we think it can be done without imposing rates which are oppressive or unreasonable, and which will compare most favorably with rates in the leading cities of the country.

223—**Rate Regulation**

A rate of 75 cents for gas would have provided for the bare necessities of operation, but we have already stated the reason why we think a lower rate would be unwise. The subject was fully discussed in conference, and the conclusion was reached that while we might safely look forward to a further reduction at no distant day, it might seriously hamper the company, and impair the service to make a radical cut at one blow. This is the policy which commissions have generally pursued. With the knowledge we now have of the company's affairs we can certainly maintain such supervision as will enable the Commission to act promptly if and when the conditions justify it.

359—**Sliding Scale**

Another consideration prompting this rate is that it affords what we consider a fair basis upon which the "sliding scale" may be established, which a lower rate might have defeated altogether. We believe the sliding scale offers the best solution now in sight, for the regulation of rates of gas and electric corporations, when the initial rate and the capitalization are equitably adjusted.

INVESTMENT AND RETURN—REFERENCES

2—**Public Service Regulation.**

The Great Problem of Public Utilities Companies, by H. M. Byllesby, Public Service, 2 pages, Jan., 1913, p. 11.

This article deplores the fact that there is today throughout the country an unmistakable tendency leading Interstate Commerce Commissions, Public Utility Commissions, and the lawmaking and law-administering bodies, to hamper and curtail and paternalize the conduct of public service corporations, to a point which

is rapidly destroying the enterprise of the individual officers and employes of such corporations, and putting a period to the further investment of capital for the extension and enlargement of such corporations, and states that the public service corporations in the past have made no greater errors of judgment or of management, and no greater departures from the correct rules of conduct, than have the communities and individuals and governments concerned with such corporations, and that whatever mistakes, hardships, errors or crimes were committed were, in any fair analysis of the question, equally chargeable to both parties to the contract.

To correct these dangers public service regulation should be placed in the hands of entirely non-political tribunals, fair-minded, experienced and candid, who will carefully weigh all the questions involved, with a proper attention to the economic questions involved, and with a full realization of the obligations of common honesty resting upon all of us to each other, to the investor, to the wage-earner and to the communities concerned.

2—Public Service Regulation.

THE TENDENCY OF THE TIMES, A REVIEW OF PUBLIC UTILITY CONDITIONS OF THE UNITED STATES, by J. H. PARDEE, Public Service, 1½ pages, Jan., 1913, p. 15.

Discusses important points of present public service regulation, and concludes: "What we suffer from now more than anything else is uncertainty, and I believe the tendency is toward some fixed basis, but again are you urged to think over these things, and go out among the people of your community and tell them the facts."

"I am a strong believer in State regulation and the protection of the public and public utility companies by commissions, and I believe that the present drastic laws will be so modified in the future that proper growth, expansion and operation can be had, and at the same time the companies will have protection by the right of appeal to the courts on any unfair decisions."

2—Public Service Regulation.

TWO PUBLIC UTILITY COMMISSIONS FOR OHIO, Public Service, Jan., 1913, p. 4.

Governor-elect Cox, of Ohio, favors a revision of the Public Utility Commission Law, which will provide for two public utility commissions, instead of one, as at present. One of these commissions would deal exclusively with the street and interurban railways of the State, while the other commission would have charge of all other public utilities.

223—Rates

Briefs by CHARLES F. MATHEWSON, of Counsel for WESTCHESTER LIGHTING COMPANY (Tarrytown, Irvington, etc., New York), in the complaints before the Public Service Commission (N. Y. 2d D.) as to the reasonableness of gas and electric rates, 180pages, and 88 pages; and supplementary brief by Louis L. G. Benedict, 88 pages.

Gives the argument of the company, with valuation of its property, and conditions of service, including widely extended region through which distribution has to be made, justifying the present rates and charges.

31—Valuation.

RAILROAD VALUATION, REPRODUCTION COST NEW AS A SOLE BASIS FOR RATES, a pamphlet of 13 pages, by D. F. JURGENSEN, Engineer of the Minnesota Railroad and Warehouse Commission, read before the Mississippi Valley States Conference on Railroad Valuation, Oklahoma City, Oct. 21, 1912.

Claims that valuations of railroad property should include only the present value of the items of physical property devoted to the public service, and that the reproduction method of making appraisals does not give this "fair value," but allows the inclusion of purely hypothetical sums, among which he classes good will, going concern and interest during construction.

36—Taxation

EXCESSIVE PUBLIC UTILITY TAXES, editorial, Public Service, Jan., 1913, p. 2.

Gives an extract from the annual report of the Virginia Railway and Power Company, calling attention to the high rate of taxes public service corporations are often required to pay, and stating that a public utility should bear its just proportion of public burdens, but excessive taxation and excessive restrictions imposed by the public, result only in defeating the object of the creation of such corporations, namely, good service at reasonable rates; and that as compared with other States and sections the sentiment as to taxation and control over such corporations is conservative in Virginia, and it is the policy of the company to bring these evils to the public attention whenever opportunity affords, with a view to creating in the public mind a better appreciation of the objects to be served by such corporations and the relations which should exist between the corporations and the public.

96—Co-Operation

CO-OPERATION IN PUBLIC SERVICE, editorial, Public Service, Jan., 1913, p. 1.

Comments on the recent offer of the American Railway Association to assist legislators in framing laws to regulate the railroads, referred to in 2 RATE RESEARCH 203, and says that the public utility companies should continue their work of publicity and increase its scope. This is the best means and practically their only means, of removing the prejudice that has been an obstacle in their way for so many years, when they have tried to take part in the making of the laws by which they are governed.

It has been charged extensively in the past that the railroads and other public utilities have influenced legislation by secret and unfair means. In so far as this is true it is to be condemned, but when the companies come forward frankly asking for the consideration that is their right, and offering the benefits of their knowledge and experience, it is proper that they should be met in a friendly spirit. When the public has a better understanding of the disposition of the companies it will support them in such action.

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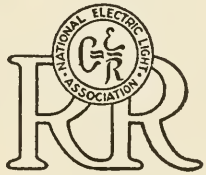
RATE RESEARCH



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Rate Research

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Rate Research

Vol. 2. CHICAGO, JANUARY 29, 1913 No. 18

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

69—Rate Schedules, Redding, California.

APPLICATION OF THE NORTHERN CALIFORNIA POWER COMPANY, for permission to increase its rates for electric power in certain parts of its territory. Decision of the Railroad Commission of California, on a rehearing adjusting rates for the entire field of its operation, Dec. 30, 1913.

This is a large company, all its electricity being developed from water power, owning 390 miles of transmission lines, 36 sub-stations, and about 20 distributing systems.
The rates ordered are:

EXHIBIT "I"

General Lighting Rate.

Applicable to all Domestic, Commercial and other Lighting not otherwise specifically classified.

First	20 K. W. H. per month	7c per K. W. H.
Next	80 K. W. H. per month	6c per K. W. H.
Next	400 K. W. H. per month	5c per K. W. H.
Next	4500 K. W. H. per month	4c per K. W. H.
Over	5000 K. W. H. per month	3c per K. W. H.

Minimum bill: $1.00 per month per meter.

Flat Rates.

Effective only in the towns of Coram, De La Mar, Ingot, Iron Mountain, Keswick, Manton, Millville, Old Diggings and Shasta and immediate vicinity.

Class No. 1.

Residence Lighting.

First three lamps	$1.00 per month
Over three lamps	25c per lamp per month

EDITORIAL NOTE.—All indented matter is direct quotation.

Class No. 2.

General Commercial Lighting.

First three lamps.....$1.50 per month
Over three lamps.....50c per lamp per month

Class No. 3.

All Night Rate.

First two lamps.....$1.50 per month
Over two lamps.....60c per lamp per month
All night lights used in connection with Class No. 1 and Class No. 2 rates, will be charged for at the rate of 60c per month.

Any lighting unit rated at 60 watts (per hour) or less shall be considered as one lamp, for the purpose of determining the flat rate applicable thereto.

Rates applying to lighting units rated in excess of 60 watts (per hour) shall be determined as follows:

Over 60 watts but not exceeding 120 watts—2 lamps.
Over 120 watts but not exceeding 180 watts—3 lamps.
Over 180 watts but not exceeding 240 watts—4 lamps.
Over 240 watts but not exceeding 300 watts—5 lamps.
Over 300 watts in same proportion.

Electric Cooking and Heating Rate.

Applicable to Electric Energy utilized for General Cooking and Heating purposes.

First 100 K. W. H. per month.....3 c per K. W. H.
Next 100 K. W. H. per month.....2½c per K. W. H.
Next 100 K. W. H. per month.....2 c per K. W. H.
Over 300 K. W. H. per month.....1½c per K. W. H.
Minimum bill: $1.00 per month per meter.

Employees' Rates.

Class No. 1.

Applicable to Company Employees connected with the Distributing Department.

First 30 K. W. H. per month.....free
Next 300 K. W. H. per month.....2c per K. W. H.
Over 330 K. W. H. per month.....1c per K. W. H.
No minimum bill.

Class No. 2.

Applicable to Company Employees connected with the Electric Generating Plants.

Free service.

Yearly Power Rates.

Class No. 1.

Applicable to Small Miscellaneous Power.

Demand charge: $1.00 per horsepower per month, plus energy charge, 1½ cents per kilowatt hour.

Minimum demand charge: $1.00 per month.

Yearly Power Rates.

Class No. 2.

Applicable to Small Industrial Power.

Demand charge: $1.00 per horsepower per month, plus energy charge, one (1) cent per kilowatt-hour.

Minimum demand charge: $10.00 per month.

Yearly Power Rates.

Class No. 3.

Applicable to General Industrial Power.

Demand charge: $1.00 per horsepower per month, plus energy charge, ¾ cent per kilowatt-hour.

Minimum demand charge: $100.00 per month.

Yearly Power Rates.

Class No. 4.

Applicable to Large Industrial and Wholesale Power not otherwise classified.

Demand charge: $1.00 per kilowatt per month, plus energy charge, ¾ cent per kilowatt-hour.

Minimum demand charge: $250.00 per month.

Seasonal Power Rates.

Applicable to Small Rural Power.

Class "A".

Normal or Irrigating Season of Six Consecutive Months.

Demand charge: $1.00 per horsepower per month, plus energy charge, one (1) cent per kilowatt-hour.

Minimum bill: $2.50 per month, for not less than six (6) consecutive months each year.

Class "B".

Short Season of Three Consecutive Months.

Demand charge: $1.50 per horsepower per month, plus energy charge, one (1) cent per kilowatt-hour.

Minimum bill: $5.00 per month, for not less than three (3) consecutive months each year.

6— RATE PRACTICE, GLASGOW, SCOTLAND

Tariffs for Electrical Energy, with Particular Reference to Domestic Tariffs, by W. W. Lackie, The Institution of Electrical Engineers (London), 13 pages, Jan., 1912, p. 1076.

This paper gives a carefully worked out modification of the two-charge rate, which has been adopted in Glasgow, Scotland, and found to be very satisfactory and successful in increasing the domestic load. The schedule obtained, as a result of these expediency modifications, has produced a higher net profit from domestic use than from any other source, and at the same time has kept a simplicity of form that it is necessary for inducing domestic users to install additional apparatus.

of consumers, and the following extracts give the main features of the analysis: The tables of data given show the comparative cost and profit of different classes

> Few persons who have looked closely into the subject will say that the maximum demand system of charging is unsound. Several prominent engineers have stated that they do not think that the system is perfect because it does not take into account the actual time of day when the maximum demand is made. This is not accurate. It is true that the maximum demand system does not indicate or recognize the actual hour at which the maximum demand of any particular consumer occurs, but it does recognize the extent to which the aggregate maximum demands of the consumers do not occur simultaneously. In other words, it does recognize distinctly whether or not any group of consumers take their supply during those hours when the maximum demand is being made by the mass of the consumers. The amount of plant to be installed to supply any given total number of consumers connected, is decreased in proportion to the extent to which the maximum demands of these consumers do not occur at the same time; and this means that the standing charges, represented by interest and depreciation, are reduced; so that the maximum demand system takes cognizance of the time when the maximum demands are made by reducing the charges to all the consumers. The system is equitable and fair because of this fact. Any flat rate, or even an approach to a flat rate, must have as its basis the maximum demand system of charging if it is to be equitable. For instance, against a rate of 3½d. per unit for lighting, a charge of 1½d. per unit for power is fair, because the power supply will be used for at least three times as many hours per day or per annum, as the lighting supply is used. . . .
>
> I should like to draw attention to what has been done in Glasgow to encourage the use of electricity by domestic consumers for purposes other than lighting. A private supply company who had resolved to encourage the further use of electricity, or who were anxious to counteract a diminution in their lighting load for domestic consumers (caused, for instance, by the introduction of the metal filament lamp), might easily advise their consumers that any units taken over the previous year's consumption would be charged at a lower rate per unit. I question very much if, in such circumstances, a municipal undertaking, or a private concern would object if the consumer added to his consumption by increasing the number or candlepower of the lamps already installed, although the object of offering the lower rate for extra units might have been to encourage the use of energy for such purposes as cooking, heating, operating vacuum-cleaners, knife-cleaners, etc.
>
> . . . .
>
> With the problem of black smoke and atmospheric pollution in one's mind, it was needful to devise a scheme which would enable the domestic consumer to get a supply of electricity for heating, cooking, etc., at a lower rate, without being put to the expense of separate wiring, with a separate meter, etc.

An analysis of between 500 and 600 purely domestic lighting accounts was instituted, and the average number of units noted for one, two, three, four, five and six rooms and kitchen-houses, and large private residences. These were also classified according to district. It was demonstrated that four rooms and kitchen-houses, of the same size as regards cubical contents, were, on the whole, consistent in their consumption of electricity for lighting purposes. As there were reasons for believing that many of these consumers would use electric radiators, vacuum cleaners, electric irons, etc., if it could be shown that this could be done, without initial expense or relatively large outlay, it seemed desirable to meet such cases by a method of charging which would give them their heating and power units at a lower rate. Having ascertained that domestic consumers' premises, similarly situated, and of the same size, were practically consistent from month to month, in the nature and the extent of their consumption for lighting, it was a simple matter to devise an adaptation of the maximum demand system which would meet their case. As their average use of the lighting maximum demand was 800 hours per annum, and the charge was 3d. per unit, it was suggested that all energy consumed over this quantity should be charged at 1d. per unit. In order to enable the consumers to realize that they were getting their extra units at the lower rate, a proportionate number of lighting units was allocated to each of the two-monthly bills, and whatever number of units might be consumed over this minimum in each two months were to be charged at 1d. per unit. The division of the 800 hours' use of the maximum demand over the six periods into which the year is divided was as follows:

	Hours' Use of Maximum Demand at 3d.
June-July	40
August-September	60
October-November	200
December-January	300
February-March	160
April-May	40
Total	800

The number of hours given corresponds to the hours of darkness from sundown to 10 p. m. each two months, and it was found that the domestic consumers' accounts also gave approximately this result.

In recommending this system of charging for heating and power in domestic premises, I ventured to prophesy that it would increase the output without adding to the expenditure on branch mains, fuses, meters, meter readers or administration, and that it would lead to a considerable use of electricity for intermittent heating in spring, summer, and autumn, when fires are generally off and only occasional heating is required, and these are the times of the year when there is a considerable amount of the station plant standing idle, i. e., earning no revenue.

The average account of the domestic consumers is shown to be £2 16s. per annum.

There are at least three charges which can be treated very largely as per consumer and not as per kilowatt, viz.:

1. The capital cost of the branch, which varies very little with the extent of the individual demand.
2. The capital cost of the meter.
3. The cost of reading the meter, rendering the account, and maintaining the meter. . . .

This system of charging for additional units at 1d. to domestic consumers has now been in use for one year. Over 500 consumers have installed electrical apparatus of some kind. One hundred of these domestic consumers' accounts, examined at random in different parts of the city, show an increased consumption of 21 per cent. as compared with the corresponding period of the previous year. This represents 7 per cent. increased revenue. If the domestic rate for lighting had simply been reduced, the probability is that the bills examined would have been less, instead of greater, than the corresponding bills for the previous year.

All further units at 1d.

RATE AND RATE REGULATION LIBRARY

The Rate Research Committee has received several requests for a list of the most important books to form a basis of a library, covering rates and rate regulation as applied to electric rates. The following are the most authoritative sources of such information:

COMMISSION REPORTS AND PROCEEDINGS

ARIZONA CORPORATIONS COMMISSION

ANNUAL REPORTS (none yet issued).

CALIFORNIA RAILROAD COMMISSION.

ANNUAL REPORTS (none yet issued).

REPORTS OF DECISIONS, issued weekly.

Advance sheets now being issued 50 cents per month. Bound volumes will be $1.50, none as yet issued.

CONNECTICUT PUBLIC UTILITIES COMMISSION.

ANNUAL REPORTS.

Preliminary Annual Report, Sept. 9, 1911, to Dec. 31, 1911.

GEORGIA RAILROAD COMMISSION.

ANNUAL REPORTS.

All matters relating to electric companies are contained in volumes beginning with the 35th Annual Report, for 1908, and continuing up to the 38th Annual Report, for the year ended April 1, 1911.

KANSAS PUBLIC UTILITIES COMMISSION.

ANNUAL REPORTS.

1st Annual Report, Dec. 1, 1911.
2nd Annual Report, Dec. 1, 1912.

KANSAS RAILROAD AND PUBLIC UTILITIES LAW, AS IT CONCERNS THE PUBLIC UTILITIES COMMISSION. Compiled by John Marshall.

MARYLAND PUBLIC SERVICE COMMISSION.

ANNUAL REPORTS.

Vol. i, for eight months ended Dec. 31, 1910.
Vol. ii, for 1911.

MASSACHUSETTS BOARD OF GAS AND ELECTRIC LIGHT COMMISSIONERS.

ANNUAL REPORTS, 1886-1912.

The first two annual reports were of the Board of Gas Commissioners.

Third Annual Report, issued Jan., 1888, was the first to relate to electric companies.

The 27th Annual Report, for the year 1912 has recently been issued. Some of the annual reports for late years are still in print.

REPORTS OF DECISIONS, issued from time to time.

MICHIGAN RAILROAD COMMISSION.

ANNUAL REPORTS.

4th Annual Report for 1910.
5th Annual Report for 1911.

QUARTERLY REPORTS OF DECISIONS.

NEBRASKA RAILWAY COMMISSION.

ANNUAL REPORTS.

3rd Annual Report, for year ended Nov. 30, 1910.
4th Annual Report, for year ended Nov. 30, 1911.

NEVADA PUBLIC SERVICE COMMISSION.

ANNUAL REPORTS.

1st Annual Report, for year 1911.
(4th Annual Report of Railroad Commission.)

NEW HAMPSHIRE PUBLIC SERVICE COMMISSION.

ANNUAL REPORTS.

1st Annual Report, for the period ended Nov. 30, 1911.

NEW JERSEY BOARD OF PUBLIC UTILITY COMMISSIONERS.

ANNUAL REPORTS.

1st Annual Report, for the year 1910.
2nd Annual Report, for year 1911.

REPORTS OF DECISIONS, issued from time to time.

NEW MEXICO CORPORATION COMMISSION.

ANNUAL REPORTS (none yet issued).

NEW YORK PUBLIC SERVICE COMMISSION (1st D.).

ANNUAL REPORTS.

1st Annual Report, 2 vols., for last six months of 1907.
2nd Annual Report, 3 vols., for year 1908.
3rd Annual Report, 3 vols., for year 1909.
4th Annual Report, 4 vols., for year 1910.

Only one volume has been issued for 1911, others will follow.

REPORTS OF DECISIONS.

Vol. i, July 1, 1907, to Sept. 1, 1909.
Vol. ii, Sept. 1, 1909, to Jan. 1, 1912. } $3.00 for the two volumes.
Vol. iii for year 1912, now being issued.

Subscription price: $2.00 per bound volume, including advance sheets, payable in advance. Advance sheets sold separately, 25 cents per monthly pamphlet.

NEW YORK PUBLIC SERVICE COMMISSION (2d D.).

ANNUAL REPORTS.

1st Annual Report, 2 vols., for last six months of 1907.
2nd Annual Report, 3 vols., for year 1908.
3rd Annual Report, 2 vols., for year 1909.
4th Annual Report, 3 vols., for year 1910.
5th Annual Report, 2 vols. issued, one to be issued, for year 1911.

REPORTS OF DECISIONS.

Vol. i, July 1, 1907, to Apr. 1, 1909.
Vol. ii, April 2, 1909, to June 30, 1911.

OHIO PUBLIC SERVICE COMMISSION.

ANNUAL REPORTS.

6th Report of Railroad Commission of Ohio for the year 1911.
This report merely mentions that on July 1, 1911, the Public Service Law became effective.

OKLAHOMA CORPORATION COMMISSION.

ANNUAL REPORTS.

1st Annual Report, for year ended June 30, 1908.
2nd and 3rd Annual Reports (1 vol.), for 1909, 1910.
4th Annual Report, for year ended June 30, 1911.

OREGON RAILROAD COMMISSION.

ANNUAL REPORTS, none issued yet dealing with electric regulation.

5th Annual Report, dated Dec. 15, 1911, the last of the purely railroad reports, merely mentions that commission has taken no steps on public utilities law, awaiting action of referendum.

Constitutional and Statutory Provisions of the State of Oregon, Relating to Railroads and Public Utilities. Compiled by Clyde B. Aitchison.

RHODE ISLAND PUBLIC UTILITIES COMMISSION.

ANNUAL REPORTS.

1st Annual Report for 1912.

VERMONT PUBLIC SERVICE COMMISSION.

BI-ENNIAL REPORTS.

12th Bi-ennial Report of Public Service Commission, June 30, 1908, to June 30, 1910.

(Name changed from "Board of Railroad Commissioners" to "Public Service Commission," April 1, 1909.)

WASHINGTON PUBLIC SERVICE COMMISSION.

ANNUAL REPORTS.

1st Annual Report, from June 8, 1911, to Dec. 31, 1911.

WISCONSIN RAILROAD COMMISSION.

ANNUAL REPORTS.

1st Annual Report, for year 1907.
2nd Annual Report, for year 1908.
3rd Annual Report, for year 1909.
4th Annual Report, for year 1910.
5th Annual Report, for year 1911, not yet issued.

REPORTS OF DECISIONS.

Vol. i, July 20, 1905, to July 31, 1907.
Vol. ii, Sept. 14, 1907, to Oct. 12, 1908.
Vol. iii, Oct. 16, 1908, to Aug. 3, 1909.
Vol. iv, Aug. 3, 1909, to March 24, 1910.
Vol. v, March 28, 1910, to Nov. 11, 1910.
Vol. vi, Nov. 11, 1910, to June 14, 1911.
Vols. vii, viii and ix, not yet issued.
Bound volumes $1.50 per vol. Advance sheets issued for each decision.

PUBLIC SERVICE COMMISSION OF THE CITY OF ST. LOUIS.

LAWS, ORDINANCES AND PERMITS PERTAINING TO PUBLIC SERVICE CORPORATIONS IN THE CITY OF ST. LOUIS.

REPORTS OF DECISIONS, as issued.

REFERENCE BOOKS

PUBLIC SERVICE LAW.

COMPILATION AND ANALYSIS OF PUBLIC SERVICE UTILITY LAWS OF THE UNITED STATES, in preparation by the DEPARTMENT ON REGULATION OF UTILITIES OF THE NATIONAL CIVIC FEDERATION. 1 Madison Ave., New York.

MODEL PUBLIC UTILITY LAW, in preparation by the DEPARTMENT ON REGULATION OF UTILITIES, NATIONAL CIVIC FEDERATION. 1 Madison Ave., New York.

SPECIAL LAW GOVERNING PUBLIC SERVICE CORPORATIONS AND ALL OTHERS ENGAGED IN PUBLIC EMPLOYMENT, by BRUCE WYMAN. Baker, Voorhees & Co., New York, 1911. 2 volumes. $12.50.

REGULATION.

THE REGULATION OF MUNICIPAL UTILITIES, by Clyde L. King. D. Appleton & Co., New York, 1912. $1.50.

JOURNAL OF PROCEEDINGS OF THE TWENTY-THIRD ANNUAL CONVENTION OF THE NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS. Digest of Federal and State Court Decisions, Interstate Commerce Laws, State Public Utility Laws. Traffic Service Bureau, Chicago, 1912. $10.00.

*REGULATION, VALUATION AND DEPRECIATION OF PUBLIC UTILISIES, by SAMUEL S. WYER, M. E. The Sears & Simpson Co., Columbus, Ohio, 1913. $5.00. (Announced and soon to be issued).

RATE THEORY.

ON THE COST OF ELECTRICAL SUPPLY, ORIGINAL PAPERS, by the late JOHN HOPKINSON, Vol. I, p. 254. University Press, Cambridge, England, 1901.

ELECTRIC REGULATION.

RATE REGULATION OF GAS AND ELECTRIC LIGHTING, by VAN SINDEREN LINDSLEY. Banks Law Publishing Co., New York, 1906. $1.50.

LEGAL PHASES OF CENTRAL STATION RATE MAKING FOR ELECTRIC SUPPLY, JAMES V. OXTOBY, privately printed by Association of Edison Illuminating Companies, New York, 1911.

RAILROAD RATES.

THE RAILWAYS AND THE TRADERS, by W. M. ACWORTH. John Murray, London, 1891. $0.50.

RAILWAY RATE THEORIES OF THE INTERSTATE COMMERCE COMMISSION, by M. B. HAMMOND. Harvard University, Cambridge, 1911. $1.00.

RAILROADS, RATES AND REGULATION, by WM. Z. RIPLEY. Longmans. Green & Co., New York, 1912. $3.00.

VALUATION.

THE VALUATION OF PUBLIC SERVICE CORPORATIONS, ROBERT H. WHITTEN, Banks Law Publishing Company, New York, 1912. $5.50.

ENGINEERING VALUATION OF PUBLIC UTILITIES AND FACTORIES, HORATIO A. FOSTER. D. Van Nostrand & Co., New York, 1912. $3.00.

VALUATION OF PUBLIC UTILITY PROPERTIES, HENRY FLOY. McGraw-Hill Book Co., New York, 1912. $5.00.

MUNICIPALITIES.

MUNICIPAL AND PRIVATE OPERATION OF PUBLIC UTILITIES, 3 volumes. NATIONAL CIVIC FEDERATION, New York, 1 Madison Ave., 1907. $10.00 net.

MUNICIPAL MONOPOLIES, EDWARD W. BEMIS. Thomas Y. Crowell & Co., New York, 1899. $2.00.

MUNICIPAL FRANCHISES, by DELOS F. WILCOX. 2 volumes. Engineering News Book Department, New York, 1910. $10.00.

STATISTICS.

THE ELEMENTS OF STATISTICAL METHODS, WILLIAM I. KING. McMillan Co., New York, 1912. $1.50.

GENERAL.

COMMERCIAL ENGINEERING FOR CENTRAL STATIONS, ARTHUR WILLIAMS and EDMUND F. TWEEDY. McGraw-Hill Book Co., New York, 1912. $2.50.

ELECTRIC METERMAN'S HAND BOOK, by the Committee on Meters, National Electric Light Association, New York, 1912. $2.50.

CURRENT PERIODICALS.

PUBLIC SERVICE REGULATION, published monthly by the Traffic Service Bureau, 30 S. Market St., Chicago. $2.00 per year.

RATE RESEARCH, published weekly by the RATE RESEARCH COMMITTEE, National Electric Light Association, 120 West Adams Street, Chicago. $10.00 per year.

42— MEASUREMENT OF DEMAND

Suit by The Minerallac Electric Company v. The Cleveland Electric Illuminating Company and Mathias E. Turner, for infringement of patent rights. Decision of the Federal Court, Northern District of Ohio, protecting the patent rights of the Minerallac Co.

The decision says:

> The patent in suit is designed to provide for an instrument, or meter, which will not only integrate and register the entire amount of current, or energy, used by a consumer of electricity, during the entire period charged for, as one month, but which will integrate and register the maximum amount of current, or energy, consumed in a definite, shorter interval of time which should be one of a certain number of equal intervals of time, into which the long, or charged for, interval, is divided.
>
> In the development of the electrical art, it became apparent to central station engineers, that all customers using the same amount of electricity were not equally desirable. Of two customers using the same number of kilowatt-hours per day, one might desire a continual, regular flow of current, the other might at intervals desire a very small amount of current, and again desire for a short time, a very large amount of current, as in the case of a church lighted once or twice a week to its full lighting capacity. To take care of this maximum demand for current, requires additional central station equipment, or in other words, it calls for additional expense in the generation of the current desired.
>
> Accordingly, to thoroughly establish a basis of charging, the two elements, of amount of electrical energy used, and how used, became important, depending upon the total number of kilowatt-hours supplied, and also upon the greatest demand which the customer makes upon the central station capacity, so far as his particular needs are concerned. . . .
>
> Merz was then confronted with the problem to provide a meter which should not only integrate and register the entire amount of current, or energy, used by a consumer during the time charged for, but should also integrate and register the maximum amount of current, or energy, consumed in a definite shorter interval of time. . . .
>
> By referring to the claims made for the defendants' structure, it is quite apparent, that both the defendants' structure, and the complainant's structure are alike in their mode of operation and their result. . . .

The complainant asks for a broad construction of the claims of the Merz patent, and from the view which I take of these claims, I think that such construction should be given to them. It appears to me that Merz was the first to combine with a current integrating meter, an arrangement for integrating for shorter intervals, the current or energy. And he was the pioneer in the conception of the realization of an invention, which consists of the use of an integrating watt-meter or current-meter, for the charged for meter, as in the original together with application thereto of an arrrangement for integrating short or equal intervals of time as to current flow in the circuit; the further indication of the maximum of the integrations for the short time periods.

The invention may appear simple to a skilled electrical engineer, but it appears to me to have involved a comprehension of the problem of measuring electricity, combined with a practical arrangement of machinery in such a way as to plainly and accurately indicate the maximum amount of electric current used in a period, as well as the current flow during an appreciable period.

BRITISH RATE COMMITTEE

Research Work Committee—British Institution of Electrical Engineers.

Word has been received under date of January 7th, 1913, that the British Institution of Electrical Engineers has just formed a Research Work Committee, for the purpose of rate research work in England, in co-operation with the Rate Research Committee of the National Electric Light Association.

RATE REFERENCES

453—Load Factor.

Using the Load Curve in Central Station Advertising, editorial, Electrical Review, Jan. 25, 1913, p. 173.

This points out how a graphic representation of the load factor may be made so interesting as to be readable for the general public of newspaper readers. Recently the Edison Electric Illuminating Company of Boston, Mass., published a section of its load curve showing daily output from 7 A. M. to noon, and beneath it the corresponding curve for the preceding day, an unexpectedly dark forenoon. The extra demand on the station was equivalent to 480,000 tungsten lamps of 20 c. p. The accompanying comment stated that this emergency supply hardly made the steam gauges on the boilers in the main generating plant waver, thus showing the capacity that is continuously maintained. Such publicity is of great value in educating patrons to a realization of operating difficulties and expenses, and why power rates and lighting rates differ, and the heavy investment required to handle the peak loads.

453—Load Factor.

Building Up a Day Load for a Small Central Station, by William E. Haseltine, Electrical Review, 3½ pages, Jan. 25, 1913, p. 184, and Electric World, 2 pages, Jan. 25, 1913, p. 196.

This paper by a central station manager, was read before the Wisconsin Electrical Association at Milwaukee, January 16, 1913, and gives an interesting account of how 24-hour service was successfully established in a community of less than 4,000, under most unfavorable circumstances, with resulting advantages to the public and the company.

51—Cost of Service.

Cost of Electrical Energy, by R. E. Crompton, and discussion by members, Journal of the Institution of Electric Engineers (London), 44 pages, June, 1884, p. 396, and discussion continued, 92 pages, July, 1894.

An analysis of the total cost of producing and delivering electric energy, considered under four heads, works cost, or operating cost, maintenance, management and profit; these are subdivided into fuel, water, stores, labor, salaries, and 7% profit on capital stock. The paper and discussion give details of plant operation, and a wide and careful study of practical problems of economy of fuel, the more economical use of steam, economy in maintenance, and in management, and tables of estimated cost of various items per unit sold, and of data from existing plants.

PUBLIC SERVICE REGULATION

299—Public Service Law.

Proposed Sections for a Model Public Utility Law, printed under the direction of the Department on Regulation of Utilities, of the National Civic Federation, New York. (Not as yet approved by the Federation.)

The different sections of this model bill have been drafted by separate committees, whose membership is made up of men who have done important work in public service regulation, of men of experience in the practical management and control of public utilities, and of recognized authorities in the study of public service problems.

The Committee on Rates is as follows:

Halford Erickson, Railroad Commission of Wisconsin, Chairman.
Charles R. Crane, Chicago.
F. A. Delano, President Wabash Railroad, Chicago.
Alexander C. Humphreys, President Stevens Institute, Hoboken, N. J.
F. K. Lane, Interstate Commerce Commission, Washington, D. C.
J. C. Lincoln, Manager Traffic Bureau, Merchants' Association, New York.
Theodore N. Vail, President American Telephone & Telegraph Co., New York.

282—Annual Reports.

Sixth Annual Report of the Public Service Commission (2nd D. New York), for the year ended Dec. 31, 1912. Albany, Jan. 13, 1913. 175 pages. (Preliminary Report.)

This report to the New York Legislature gives a general summary of the work of the Commission, in the matter of inspections, applications of companies, complaints, information of the mergers and consolidations, and tables of the capitalization, earnings and dividends of public service corporations. The report also calls attention to defects in the public service law, and makes recommendations thereon.

Two paragraphs of special interest to electric companies are:

Gas and Electric Rate Schedules: The report of the special committee appointed to consider a form for the reporting of gas and electric schedules of rates, made its report during the past year. The Commission has this report under consideration.

Tariffs of Gas Corporations and Electrical Corporations, and Municipalities: The committee appointed at the hearing September 7, 1910, to consider the subject of filing with the Commission, and the publishing of rates, by gas corporations and electrical corporations, and municipalities, made its report to the Commission, and the issuance of regulations to govern the form and publication of such schedules is now under consideration.

115—Use of Public Highways.

Appeal of the Madison Gas and Electric Company from the provisions of an ordinance of the City of Madison. Decision of the Wisconsin Railroad Commission declaring the ordinance null and void. Electrical Review, Jan. 25, 1913, p. 196.

The ordinance in question provided for the removal of all poles and wires from certain residence streets of the city, with the exception of the poles required at street intersections for street lighting purposes. It was prompted by esthetic considerations only, and, in the opinion of the Commission, the improvement in the appearance of the overhead system, as contemplated by the utility, is all that could reasonably be expected under the circumstances. The decision calls attention to the fact, however, that should the city adopt some form of street lighting, other than the present arc system, a different question would be presented, and in that event the removal of all poles would not only be desirable but necessary.

83—Municipal Ownership.

The Bi-ennial Convention of Mayors, Aldermen, City Attorneys and Other City Officials of the Cities of Montana, met at Helena Jan. 15, to decide upon proposed legislation pertaining to city affairs. An important part of the discussion was over municipal ownership of utilities. Notwithstanding that some of the city officers submitted reports showing that the rates charged by the Miles City Electric Company, at present the only municipally-owned electric company in Montana, were higher than any others in the State, and that in Townsend, which has recently sold its municipal plant, the service had been poor and costly, and the municipal operation of the utility for six years had resulted in a deficit of $20,765.96, yet the convention endorsed a plank calling for authority for the municipal construction and ownership of lighting, heating and water plants. A recommendation was also carried endorsing a public utility commission bill, which will probably be enacted during the present session of the State Legislature.

Vol. 2 February 5, 1913 No. 19

RATE RESEARCH

PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

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Rate Research

Vol. 2. CHICAGO, FEBRUARY 5, 1913 No. 19

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

COOKING AND HEATING RATES

69—Rate Schedules

Schedules filed with the Rate Research Committee show that the following cities have adopted a special rate for cooking and heating, or both:

ATLANTA, GEORGIA

The ordinary power rate ranging from 6c per kilowatt-hour to 3c per kilowatt-hour is used, but special consideration is given in the matter of estimated demand which is figured at 50 per cent of the connected load.

ALTOONA, PENNSYLVANIA

4½c per kilowatt-hour on separate meter.

BOSTON, MASSACHUSETTS

Miscellaneous rate for cooking and heating and other uses.
10c per kilowatt-hour for the first 20 kilowatt-hours per month.
3c per kilowatt-hour for excess use.
Minimum charge $12.00 per year.
Under certain off peak conditions and for large consumption the rate for over 2,000 kilowatt-hours is reduced to 2c per kilowatt-hour.

DES MOINES, IOWA

4½c per kilowatt-hour on separate meter.

DETROIT, MICHIGAN

The maximum power rate, 4c per kilowatt-hour is used.

DULUTH, MINNESOTA

Rate for cooking and heating, vacuum cleaners, and washing machines:
3c per kilowatt-hour, less 20 per cent prompt payment discount.
Minimum charge $1.00 per month.

EDITORIAL NOTE.—All indented matter is direct quotation.

KANSAS CITY, MISSOURI

Cooking rate 4½c per kilowatt-hour.
Separate meter used.

LOS ANGELES, CALIFORNIA

5c per kilowatt-hour with separate meter.
Minimum charge $3.00 per month.

MEMPHIS, TENNESSEE

$1.50 per month per kilowatt of demand plus 3c per kilowatt-hour.

OMAHA, NEBRASKA, cooking rate

6 cents per kilowatt-hour.
5 per cent discount if complete cooking outfit is installed.
No heating rate.

PORTLAND, OREGON

4c per kilowatt-hour.
Minimum charge $1.00 per month.

REDDING, CALIFORNIA

3c for the first 100 kilowatt-hours per month.
2½c for the next 100 kilowatt-hours per month.
2c for the next 100 kilowatt-hours per month.
1½c for excess over 300 kilowatt-hours per month.
Minimum charge $1.00 per month.
Approved by the California Railroad Commission (see 2 R. R. 272).

SALT LAKE CITY, UTAH

6.6c per kilowatt-hour with separate meter.
Minimum charge $2.00 per month.
Prompt payment discount 10 per cent on all charges including minimum.

SEATTLE, WASHINGTON

3c per kilowatt-hour with separate meter.
Minimum charge $2.00 per month.

SPOKANE, WASHINGTON

Takes the industrial rate, 5c per kilowatt-hour.

SPRINGFIELD, MASSACHUSETTS, heating rate

6c per kilowatt-hour.
No cooking rate.

SUPERIOR, WISCONSIN

5c per kilowatt-hour for the first 50 kilowatt-hours per month.
4c per kilowatt-hour excess use.

GLASGOW, SCOTLAND

Domestic use including cooking and heating.
3d. per kilowatt-hour for a certain hours' use of maximum demand, ranging from 40 hours in the summer months, to 300 hours in December and January.
1d. per kilowatt-hour for excess use.
This rate is explained in 2 R. R. 274.

LONDON, ENGLAND

St. Marylebone Electric Supply.

If used in connection with Telephone System rate, the cooking and heating rate is,
½d. per kilowatt-hour. (See 2 R. R. 83.)

The companies in the following cities report that they have no special rate for cooking or heating:

Baltimore, Maryland.
Birmingham, Alabama.
Brooklyn, New York.
Buffalo, New York.
Charleston, S. C.
Cambridge, Mass.
Canton, Ohio.
Cincinnati, Ohio.
Cleveland, Ohio.
Dayton, Ohio.
Denver, Colorado.
East St. Louis, Ill.
Fall River, Mass.
Houston, Texas.
Louisville, Kentucky.
Manchester, Vermont.
Milwaukee, Wisconsin.
Minneapolis, Minn.
Newark, N. J. (and other Public Service Electric Co. cities).
New Orleans, La.
New York City, N. Y.
Peoria, Ill.
Providence, R. I.
Rochester, New York.
San Antonio, Texas.
Scranton, Pa.
St. Paul, Minn.
Tacoma, Washington.
Wilkes-Barre, Pa.
Hamilton, Ontario.
Chicago, Illinois.

NOTE.—The Rate Research Committee will be glad to print any additional cooking or heating rates that may be adopted from time to time.

COMMISSION DECISIONS—CALIFORNIA

619—Rate Differentials

COMPLAINT OF THE TOWN OF WILLETS (pop. 1,153) v. WILLETS WATER AND POWER COMPANY, charging excessive and discriminatory rates. Decision of the California Railroad Commission adjusting rates. Case No. 297.

This case is one of water rates, but the question of discrimination on which it turns, and the principles on which the decision is based, apply equally to electric companies, and are of great importance

for the argument and proper presentation of cases when companies are seeking approval of differential rates.

The following paragraphs cover the essential points:

31—Valuation.

The case was much simplified by the practical agreement between the parties that **the gross revenue** of $8,127, secured by the company during the last succeeding year, **was not an excessive amount for the service performed. This makes it unnecessary for the Commissioner to go into various matters of valuations and operating expenses,** which would be necessary if the revenue itself were attacked, and makes it only necessary to determine the questions of discrimination alleged in the complaint, and made the subject of evidence in the case.

339—Fixed Charges.

The amount of water used for fire service is practically negligible, during the year 1911 and 1912, none having been used so far as can be ascertained. Yet, it is well established that where fire protection is rendered to a community, the initial expenditure required for the installation of this service is proportionately large. Our engineering department reports that in this particular case, the facilities made necessary for fire protection purposes represent about 10 per cent of the entire cost of the system.

619—Rate Differentials—Discounts.

In the service of water, as well as other commodities, there is usually a less proportionate cost in furnishing to one large consumer than in distributing an equal amount among many small consumers. Therefore, having regard to the cost of service, wholesale rates can, and properly should be accorded. It is often very hard, however, to determine just what concession should be given to those who use large quantities of a commodity, but in the present case I believe that a rate of $600 per annum would be, under all the circumstances, fair to the Northwestern Pacific Railway Company.

55—Value of Service Theory.

I have had in mind in the Northwestern Pacific case, the fact that a limiting rate might be reached beyond which it would pay that company to provide its own supply of water. As I have already said, it is hard to determine just when a consumer leaves the retail and goes into the wholesale class, but when a consumer uses a sufficient amount of a commodity to entitle it to a wholesale rate, then the reduction from the rate which the quantity of a commodity otherwise would require, must have reference to, and be justified by, the less proportionate cost of furnishing the larger

supply to the one consumer, with a limiting rate which is the highest amount which this wholesale consumer can be forced to pay and be retained as a customer. In other words, a large user of a commodity should have that proportionate deduction which the decreased cost of furnishing the commodity to it, entitles it, and this rate should be fixed unless it passes the limiting rate already discussed.

PUBLIC SERVICE REGULATION

COMMISSION DECISION—NEW JERSEY

132—**Protection from Competition.**

Efforts have been made in some quarters to interpret President-elect Wilson's words, "I do not care how big a particular business gets provided it grows big in contact with sharp competition," as applying to the operation of public utilities, but it should be noted that his own state commission has definitely gone on record against competition in public utilities. The following decision was handed down by the New Jersey Board of Public Utility Commissioners soon after its organization, declaring the economic unsoundness of competition in public utilities.

Application of the Atlantic Highlands Gas Company for permission to use franchise granted by the township of Shrewsbury to lay conduits for supplying gas. Decision of the New Jersey Board of Public Utility Commissioners denying the application. May 31, 1911.

The decision holds:

> Experience has gone a long way towards demonstrating that services afforded by public utilities tend eventually to be rendered under conditions of monopoly. It is true that for a time a public utility may compete with another, supplying the same body of consumers with the same service. But experience demonstrates that such competition is likely to be short-lived. The two competitors are influenced by the considerations of securing higher prices by the mutual cancellation of their competition, and not infrequently by the possibility of reducing costs by a union of parts of their productive apparatus. Where actual fusion of the two erstwhile competing concerns does not result, a division of territory, or joint agreements as to rates, prices or service, not uncommonly operate to leave consumers at the mercy of a virtual monopoly. The low prices prove but temporary, and the transient gain is succeeded by a long period of loss. That public opin-

ion has come to recognize the almost inevitable outcome of such temporary competition between public utilities is evidenced by much recent legislation. The creation of various boards and commissions with supervisory powers over public utilities, and often with eventual powers of rate-fixing, demonsrates that the illusive doctrine of competition in this field, is being superseded by an experimental regime of strictly regulated monopoly.

Two other influential considerations operate in the same general direction. Where competing companies, with franchises, serving the same consumers, finally unite, the unnecessary duplication of plant and appliances entails a permanent burden upon the public. Even where prices, after due hearing, may be prescribed by public authority, some regard must be paid to the interests of bona fide investors. The prices set must have some reference to the capital legitimately sunk in the equipment of the formerly competing plants. It not infrequently results that the prices eventually authorized are higher than they would need to be, if no more than the necessary amount had been originally invested in plant and appliances adequate for the supply of consumers. Thus the evils of an ill-judged competitive experiment, in a field unsuited therefor, perpetuate themselves and burden the consuming public.

It is hardly necessary to add that the unnecessary installation of pipe, conduits, mains, wires, tracks and the like by two competing public utilities in the same region, augments unwarrantably the disturbance of traffic through the public thoroughfares, and creates gratuitous nuisance.

The authorization for the Board's action is found in paragraph 24, sec. iii, ch. 195, of the New Jersey Laws of 1911, as follows:

No privilege or franchise hereafter granted to any public utility as herein defined, by any political sub-division of this State, shall be valid until approved by said board, such approval to be given when, after hearing, said board determines that such privilege or franchise is necessary and proper for the public convenience and properly conserves the public interests.

And in its third annual report, for the year 1912, to the Governor of New Jersey, under date of December 31, 1912, the Board again says:

The board is of opinion that the approval of a franchise affording a competing company entrance into a district already adequately supplied by a public utility is ordinarily neither necessary nor proper for the public convenience, and jeopardizes rather than conserves the public interests. Unless good reason to the contrary can be shown, this attitude will be maintained by the board.

224— THE FILING OF SCHEDULES

The following is a brief summary of the status of the filing of sc ules by electrical companies, as required by the law, and as prescr by commissions, in the different states. The tabulated refere given will be found to contain, expressed variously, but in substa agreement, the sections of laws dealing with electric schedules, t filing, publishing, and forms.

A. Companies Shall File and Publish Schedules of All Rates.

Arizona	Session Laws,	1912, ch. 90, sec. 14 (b)
California	Stats.,	1911, ch. 14, sec. 14 (b)
Kansas	Laws,	1911, ch. 238, sec. 11
New Hampshire	Laws,	1911, ch. 164, sec. 7 (a)
Ohio	Laws,	1911, No. 325, sec. 18
Oregon	Gen'l Laws,	1911, ch. 279, secs. 25 and 72
Vermont	Laws,	1908, No. 116, sec. 18
Washington	Laws,	1911, ch. 117, sec. 27
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-27, 2

B. Commission May Require Companies to File Schedules.

New York	Laws,	1910, ch. 480, sec. 66 (12)
New Jersey	Laws,	1911, ch. 195, sec. 16 (d)

C. Commission May Prescribe Form of Schedule.

Arizona	Session Laws,	1912, ch. 90, sec. 14 (b)
California	Stats.,	1911, ch. 14, sec. 14 (b)
Michigan	Pub. Acts,	1911, No. 139, secs. 10 (d) (e)
Nevada	Stats.,	1911, ch. 162, sec. 5
New Hampshire	Laws,	1911, ch. 164, sec. 7 (a)
New York	Laws,	1910, ch. 480, sec. 28
Rhode Island	Acts,	1912, ch. 795, sec. 48
Washington	Laws,	1911, ch. 117, sec. 27

D. Commission May Prescribe Changes in Form of Schedules.

Oregon	Gen'l Laws,	1911, ch. 279, sec. 32
Wisconsin	Laws,	1907, ch. 499, sec. 1797m-34

E. No Change May Be Made in Schedules Without Commission's Approval

Arizona	Session Laws,	1912, ch. 90, sec. 15
California	Stats.,	1911, ch. 14, sec. 15
Kansas	Laws,	1911, ch. 238, sec. 20
Maryland	Laws,	1910, ch. 180, sec. 15
New Mexico	Laws,	1912, ch. 78, sec. 17
Ohio	Laws,	1911, No. 325, sec. 22
Oregon	Gen'l Laws,	1911, ch. 279, secs. 29, 30
Rhode Island	Acts,	1912, ch. 795, sec. 48

Vermont .....Laws, 1908, No. 116, sec. 18
Washington .....Laws, 1911, ch. 117, sec. 28
Wisconsin .....Laws, 1907, ch. 499, sec. 1797m-31, 32

*Wisconsin
Vermont
Oregon
} require 10 days' notice of change

*Arizona
California
Maryland
New Mexico
Ohio
Rhode Island
Washington
} require 30 days' notice of change

F. Commission May Require Utility to File with It a Copy of Any Contract, Agreement, or Arrangement, in Writing, with Any Other Public Utility, Relating in Any Way to the Construction, Maintenance or Use of Its Plant, or Property, or Any Service, Rate or Charge.

Ohio .....Laws, 1911, No. 325, sec. 11

G. State, Municipal or Federal Contracts Need Not Be Published.

New York .....Laws, 1910, ch. 480, sec. 28

Orders Have Been Issued by the Following State Commissions to Utilities to File Schedules.

MARYLAND PUBLIC SERVICE COMMISSION, order effective, June 30, 1911.

MASSACHUSETTS BOARD OF GAS AND ELECTRIC LIGHT COMMISSIONERS, order effective March 1, 1912.

MICHIGAN RAILROAD COMMISSION, order effective Jan. 15, 1913.

NEW YORK PUBLIC SERVICE COMMISSION (1st D.), order effective, Jan. 15, 1909.

OHIO PUBLIC SERVICE COMMISSION, order effective, June 1, 1912.

OREGON RAILROAD COMMISSION, order effective, Jan. 15, 1913.

Each order except the Massachusetts one, prescribes the form of schedule to be filed.

The references to the laws ordering the filing of schedules, were suggested by the pamphlet, *Publicity of Rates,* 62 pages, issued by the *National Civic Federation, Department on Regulation,* which contains the sections of laws of the United States, and the several states, covering the filing of schedules, the greater number of which refer to railroad rates.

COURT DECISIONS

81—Municipal Regulation of Utilities

STATE ex rel. MARSHALL, ATTORNEY FOR PUBLIC UTILITIES COMMISSION v. WYANDOTTE COUNTY GAS COMPANY, Kansas City (pop. 82,331) and Rosedale (pop. 16,000) to enjoin the company from increasing its rates. Decision of the Supreme Court of Kansas giving judgment for the Commission. 127 Pacific Reporter, 639.

The company raised its price for gas from 25 to 27 cents per thousand, claiming that the state commission's jurisdiction is confined to inter county, or state wide utilities, and that the company was authorized to change its rates, by municipal ordinances containing among other provisions, one conferring the privilege of raising its rates, and which ordinances having been accepted by the company, became thereby, contracts inviolate.

The decision holds

> The Public Utilities Commission for the state of Kansas has full power, authority, and jurisdiction to supervise and control all public utilities described in Section 3 of the act (Laws 1911, c. 238), with exceptions therein specified, and a public utility which owns or operates a separate equipment, plant or machinery, for any of the specified purposes, in two or more cities, is not within such exceptions.
>
> The power to contract for rates for the furnishing of water, light, heat or power to a city or its inhabitants, is a sovereign, governmental power which is vested in the law-making power of the state. The power may be delegated to the mayor and council of a city, but is not to be inferred from mere convenience, but must be specifically granted, or be absolutely essential to the exercise of other powers expressly conferred upon such mayor and council.

COMMISSION REPORTS

2—Public Service Regulation.

Report of the Massachusetts Board of Gas and Electric Light Commissioners, concerning public utility regulation laws. Electrical Review, 1 page, Feb. 1, 1913, p. 243, and Electrical World, ½ page, Feb. 1, 1913, p. 237.

This report is made under the order of the Massachusetts Legislature of 1912 directing the Board "to revise, consolidate and arrange, the general laws of the Commonwealth pertaining to the manufacture, distribution and sale of gas and electricity, and to corporations, engaged therein." and to consider the expendiency of additional legislation for supervision and regulation. The Board recommends that the codification of existing laws should cover

> (1) the formation, internal government and relation of such corporations to their stockholders and creditors; (2) the acquisition, financing and management of municipal plants; (3) the use of the public streets for the distribution of gas and electricity; (4) public supervision and regulation of the business of supplying gas and electricity.

It also recommends that in case of purchase of a plant by a municipality, when the price is in dispute, it should be referred to the Board of Commissioners rather than, as now, to a special commission appointed by the court; also that no combination of gas and electric, or transmission companies, be allowed to be organized without the approval of the Board, after public hearing.

On the question of the proposed regulation of transmission companies organized for the purpose of distributing and selling power on a large scale, as distinguished from those corporations which generate and sell to small consumers, which are now under the Board's supervision, a majority of the Board favor the regulation of such companies, while one member believes such regulation is not needed, giving as his reason that competition, in this branch of the industry, is wholesome and non-destructive, inasmuch as it involves no duplication of plants or distributing systems, which are the conspicuous evil in competition between public service corporations, and may therefore be left to regulate the business of transmission companies.

A most important recommendation of the Board is as follows:

> **In the case of discriminating rates, the commission does not deem it wise in the present development of the business of supplying gas and electricity, to interfere actively with differential rates which are fixed solely to meet conditions competitive in their character, and to that extent beyond the company's control, provided that the companies are thereby aided to give the community as a whole lower rates and better service.**

282—Annual Reports—New Jersey

THIRD ANNUAL REPORT OF THE BOARD OF PUBLIC UTILITY COMMISSIONERS OF NEW JERSEY, Dec. 31, 1912. The Gas Age, 2¼ pages, Jan. 15, 1913, p. 91.

This is an abstract of the New Jersey Board's annual report to the Governor for the year 1912, giving the various sections covering points of interest to utility companies, among them being the Board's actions on uniform accounting, approval of security issues, approval of franchises, accidents, meter provers, inspections, and suggested amendments to the law.

REFERENCES

RATES

62—Character of Service.

ELECTRICALLY EQUIPPED COAL MINES IN NOVA SCOTIA, by C. H. WRIGHT, illustrated article, Electrical World, 2½ pages. Feb. 1, 1913, p. 239.

This gives data from the operations of electrical equipment in the mines and power houses of the Dominion Coal Company, the first installation having been made in 1906. They have utilized the application of exhaust steam turbine and pulverized fuel—operation on 25-cycle current.

62—Character of Service.

ELECTRICITY IN COTTON MILLS, illustrated article, Electrical Review, 6 pages. Feb. 1, 1913, p. 227.

Gives operating data on several typical cotton mills purchasing power, together with a discussion of the general features of mill electrification, and states that the use of motors in cotton mills has been the means of increasing production from two to ten per cent, depending on the efficiency of the installation.

69—Rate Schedules—New York City.

Electricity Rates, New York City, 1913, Reprint from an Appendix of the Annual Report of the Public Service Commission (1st D. New York) for 1913, Advance Sheets. Published by the Public Service Commission (1st D. New York), 154 Nassau Street, New York City. January, 1913, 13 pages.

This part of the annual report is published as a separate pamphlet every year, and gives the schedules filed with the commission by the electric companies operating in Greater New York City, including the New York Edison Company, the United Electric Light & Power Company, the Westchester Lighting Company, and the Queens Borough Gas and Electric Company, for all different kinds of service.

755—Meters.

A New Differential Watt-Per-Candle Meter, by Edward P. Hyde, editorial and article, Electrical Review, 2¾ pages. Feb. 1, 1913. p. 222 and p. 248.

As the life of an incandescent lamp depends primarily on the temperature at which it is operated, the measurement of the watts expended per candle of light produced, is important in testing new inventions and improvements in lamps. A new instrument for measuring this "specific consumption" has now been perfected, and is fully explained in above article.

INVESTMENT AND RETURN

221—Regulation of Capitalization—New York

Application of the Kings County Electric Light and Power Company for permission for a bond issue. Decision of the Public Service Commission (1st D. New York) approving the issue. The Gas Age, Jan. 15, 1913, p. 93.

The Commission's opinion finds that the issue of $2,500,000 6 per cent convertible debenture bonds, as asked for, is necessary for the acquisition of property, and for construction, and the improvement and extension of its facilities, and orders also, as applied for, the issue by the Edison Electric Illuminating Company of Brooklyn of $2,200,000 face value of principal of its demand notes, with interest, to the Kings County Electric Light and Power Company.

83—Municipal Ownership

Central-Station Results at Holland, Michigan, Electrical World, 1 page. Feb. 1, 1913, p. 250.

Gives interesting information of the Holland Municipal Light and Water plan, made more important by the fact that it enjoys the double distinction of having had competent management for eighteen years, and of being one of the few municipal stations in which complete records are kept of the essential factors of the business. Two tables showing this data are given.

223—Rate Regulation.

THE DECISION IN THE MILWAUKEE FARE CASE, by EDWIN S. MACK, read before the convention of the Wisconsin Electrical Association, Milwaukee, Jan. 15 and 16. Electrical Review, Jan. 25, 1913, p. 204.

This is a brief history of the decision of the Wisconsin Railroad Commission in the Milwaukee street railway fare case, referred to in 2 RATE RESEARCH 58, 59.

223—Rate Regulation.

THE CONSOLIDATED RATE CASE, editorial Electrical Review, Jan. 25, 1913, p. 174.

Comments on the decision of the Maryland Public Service Commission in the Baltimore rate case, and says that the allowance of $5,000,000 for easements is a precedent which may be troublesome to the Commission in future cases, since such a value is not inherently different from a franchise value, the allowance of which, above the expense incurred in securing the franchise, is specifically prohibited by law in some states, and that the decision as a whole will no doubt serve to give confidence to investors in Maryland properties that their rights will be fully protected by the Public Service Commission.

313—Prices

THE PETROLEUM INDUSTRY IN 1912, abstract of article by DAVID T. DAY, of the United States Geological Survey. The Gas Age, 1 page, Jan. 15, 1913, p. 83.

This gives the production of petroleum by states, and the prices, and wells drilled during 1912. It states that the indications are for the rapid increase in the use in the United States, of internal combustion engines of the Diesel type, which have already been so generally adopted abroad.

39—General Economic Information

PRODUCTION OF LUMBER BY STATES AND KINDS. MAP PREPARED BY THE OFFICE OF GEOGRAPHY, OF THE UNITED STATES DEPARTMENT OF AGRICULTURE, FOREST SERVICE.

This is a map of the United States, illustrated with colored squares, and accompanied by colored diagrams and tables, showing the total production of soft and hard woods, in the different states, the proportion of each, and the average mill value per thousand feet, for the calendar year 1910.

PUBLIC SERVICE REGULATION

92—Economy and Efficiency.

OVERLOADING THE INTERSTATE COMMERCE COMMISSION. Engineering News, 1 page. Jan. 30, 1913, p. 223.

States that one of the most glaring examples at the present time, of the tendency to overload public officials with work beyond the possibility of its efficient performance, is that of the Interstate Commerce Commission, and that the almost overwhelming and increasing multiplicity and diversity of the duties now laid upon the Commission, endanger the success of the great and important experiment of government regulation of public utilities, which we are now trying on such a large scale.

2—Public Service Regulation.

Regulation of Service, a 69-page pamphlet, and Regulation of Intercorporate Relations, a 17-page pamphlet, issued by the Department on Regulation, of the National Civic Federation, are two of the sixteen parts into which is has divided its compilation and analysis of the public utility regulation laws of the United States.

The first gives, arranged conveniently under twelve main headings, the sections in the laws of the different states, prescribing and regulating the service requirements of all public utilities.

The second gives the statutory provisions conferring commission jurisdiction over transfers, leases, stock control, consolidations or mergers, and reorganizations of public service companies.

Two other pamphlets of the series have been received, General Powers of Commission, and Discrimination in Rates and Service, and tabulated summaries of these will be given in a later Rate Research.

223—Rate Regulation.

Railroad Rates and Regulation, by William Z. Ripley, Ph. D., Professor of Economics in Harvard University, Longmans, Green & Co., New York, 1912. 659 pages, $3.00.

This important book is a most valuable source of information for any student of rates and of public regulation. Though its subject matter is railroads, the principles of the construction of rates, and the lines along which regulation has developed, are significant and instructive for men engaged in the problems of working out the best and most practicable electric rates.

Some chapter headings will show what useful data will be found in this work. Chapters II and III, The Theory of Railroad Rates; Chapters IV and V, Rate Making in Practice; Chapters VI and VII, Personal and Local Discrimination; Chapter XI, Special Rate Problems; Chapter XII, The Movement of Rates Since 1870, Rate Wars; Chapter XX, The Conflict of Federal and State Authority; Open Questions.

96—Co-Operation

Co-Operative Regulation, editorial. The Gas Age, Jan. 15, 1913, p. 75.

This calls attention to the admirable plan of the National Civic Federation in establishing a Department on Regulation of Utilities, to bring about conferences and joint discussions, and opportunities for a better understanding, and more adequate and acceptable dealing with the regulation of all public service utilities, by the men responsible for the regulation, and the men engaged in the practical work of operating the utilities. A well considered first step was the collecting by the Federation, of extensive information of the existing utilities of the country both municipally and privately owned, and the publication of this in a voluminous report. This investigation led to the conviction that regulation is preferable to public ownership or operation, and the Federation has since been engaged in compiling the public service laws of the different states, and, to correct the defects that experience has shown in them, is now formulating a model public service utilities bill, which is being drafted with the advice and co-operation of the most competent men in the country to speak on the subject. It is both wise and proper that the governed should have a voice in making the laws. It is of the utmost interest to companies, as well as a benefit to the public to check hasty and radical regulation, and to standardize requirement of service.

2—Public Service Regulation

MESSAGES OF THE GOVERNORS AS RELATING TO PUBLIC UTILITIES. Electric Railway Journal. 2 pages. Jan. 25. 1913. p. 160.

This article comprises extracts from the messages of the Governors of eleven states, including that of Governor Wilson to the New Jersey Legislature, urging more stringent regulation of the issuance of securities, and some responsible official supervision of the whole process of incorporation of public service companies, and that no investment company of any kind be allowed to sell securities in New Jersey without public license, issued by the department exercising the rights of inspection and regulation; and extracts from the messages of the Governors of Minnesota, Indiana, Missouri, Colorado and Montana, favoring the establishing of public service commissions, and recommendations from other states for the enlargement of the powers of the present commissions.

GENERAL

83—Municipal Ownership.

SOME PROBLEMS OF PUBLIC OWNERSHIP, by WALTER ALLEN. North American Review. 13 pages. Jan. 1913. p. 8.

Discusses the arguments for and against public ownership broadly, from the points of view of the social, political and financial effects which result from such assumptions of business undertakings by the State, and concludes, after an instructive review of municipal operations in this country, and in England, that experience proves conclusively that there have not been gains to compensate for the numerous evils and disadvantages of public ownership.

95—Progress in the Art.

RECENT DEVELOPMENT OF GAS POWER IN EUROPE, by H. J. FREYN. Engineering News. 2¼ pages. Jan. 30. 1913. p. 228.

States that the development of the internal-combustion engine in Europe during the last year has been very marked, and great strides were made, especially by the Diesel engine. The unparalleled progress of this prime mover, due primarily to the expiration of the basic Diesel patents, created a wave of enthusiasm, the crest of which swept Europe only a short time ago. To the careful observer, however, signs of an ebbing of this wave are apparent, and more sober, healthy views are gaining ground.

95—Progress in the Art

THE DIESEL ENGINE FOR CENTRAL STATION SERVICE ON THE PACIFIC COAST, by J. W. WHITE, JR. Journal of Electricity, Power and Gas. 2¼ pages. Jan. 25. 1912. p. 86.

This is a discussion of the comparative merits, and costs per kilowatt of power developed, of Diesel engines and steam turbines, in which the writer states that it is definitely certain that the commercial application of the Diesel engine to certain classes of industrial and central station service, will bring about cheaper power costs than any other type of prime mover on the market today, but until the manufacturing cost of Diesel engines is reduced materially, its general applications for central station service will be limited. Estimates of the costs of installation of both steam and Diesel units are given, and a curve showing total power costs per kilowatt of both.

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Rate Research

Vol. 2. CHICAGO, FEBRUARY 12, 1913 No. 20

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

ELECTRIC RATES AND CLASSIFICATION OF CUSTOMERS

WHY ELECTRIC COMPANIES SHOULD ADJUST THEIR RATES SO AS TO GET ALL OF THE BUSINESS POSSIBLE

Prepared by a Member of the Rate Research Committee of the National Electric Light Association

When a business is subject to unlimited competition, all its rates automatically seek a level where they give the owner barely a minimum return, or possibly provide no profit at all, since, when they rise above this level, more competition develops, and when they fall below the competition ceases until they rise again.

In the case of a monopoly, and particularly of various public service monopolies, the rates are not entirely controlled by competition, and in the case of public service monopolies, it is expected that either public sentiment, the courts, or commissions, shall regulate the rates to a point at least as low as they would have been in the long run, if subject to competition.

EDITORIAL NOTE.—All indented matter is direct quotation.

The degree of monopoly of public service corporations is greatly overestimated, since most of their monopoly is in form only. An electric company may have exclusive rights to supply electricity for light, power, heat, etc., but it has no monopoly in the supply of light, power or heat as such. In the case of electric light it has as active competitors, candles, oil and gas; in the case of electric power, it competes with animal power, gas and oil engines and steam engines; in the case of electric heat, with gas, oil, coal and blankets, and in spite of what may seem to be a monopoly in the supply of these services in the electric form, it finds tremendously active competition in substance—competition which seriously affects its business the moment it raises its prices above a certain point.

Below a certain point in its prices, the electric company may have a monopoly, and public sentiment requires that its prices shall, in the long run, be lower than if the competition were unlimited, and this point is where all the prices together produce just a fair return on the investment.

It is for the interest of the owners, as well as of the public, to keep the prices at this point, but for any given short period the owner is always attracted by the idea of a high return and high dividend, so that the apparent or momentary interests of the owner and public may seem to be opposed.

However, while the interests of the owner and of the public are at any moment apparently opposed on the question of the total profits, there is another question on which the interests of the owner are not opposed to those of the public, and that is the division of the total profits as coming from the different customers. To secure a given return on a certain investment, it makes no difference to the owners whether this comes mostly from power, or mostly from light; mostly from large customers, or mostly from small, and when the total profits are unaffected there is nothing to lead the owner to take any action, in the way of changing this division adversely to the public interests.

The question of division of costs among different customers or classes, is an entirely separate question from the question of total costs or fair return. Having decided finally, or for the time being, what is a fair return on the investment in a given electric or other public service company, the separate

question is still open—how shall the rates that are to produce this income be adjusted as between the different classes of customers?

The first answer (and a theoretically correct one) is that each individual customer should be charged at least what it costs to serve him.

The trouble is that this only distributes a small portion of the costs as between customers.

To make this clear I will take an example often used. If a farmer kill a calf and skin it, what is the cost of the veal and what is the cost of the hide? The cost of curing the hide is clearly part of the cost of the hide, and the cost of storing and selling the meat is part of the veal cost, but the original cost of the live calf, and of the labor of killing and skinning are joint costs which may belong to either.

If a railroad train is going anyway, the extra cost if a passenger gets aboard (corresponding to the extra cost if the hide of the calf is cured instead of being thrown away) is very small. The extra cost in such case is the little extra coal used in hauling his weight. The rest of the costs, such as the engineer and conductor, the maintenance of the roadbed, etc., are joint costs, which may belong to any of the passengers, or to freight or postal or other service.

If an electric light is burned, or motor used, the electric company uses perhaps a little more coal, costing perhaps $\frac{1}{2}$ cent per kilowatt hour for each kilowatt hour used, but the rest of the expenses are not immediately affected. They are joint costs which may belong to any of the lights or any of the motors, or to some other part of the business.

In many businesses—and especially such a business as electric light and power service—most of the expenses are the same whether any particular customer uses the service or not, and it is only certain small expenses that are necessarily part of the cost of each customer. These latter are sometimes grouped under the general term the "increment cost," the cost incurred by adding that customer to the system, or saved if he is disconnected. The remaining and greater portion are joint costs, which may belong to all of the customers or the customers as a whole.

Increment costs must be, or rather should be, apportioned to individuals, or special classes that cause them.

Joint costs must be divided in some way as between all the customers; the question is, how shall we decide how much of the cost of the calf shall be paid by the purchaser of the veal, and how much by the purchaser of the hide?

No absolute accountant's line can be drawn between increment and joint costs. For instance, in railroad freight, suppose a given traffic goes south. So long as cars come back empty the increment cost of extra freight north is only handling and a little coal. All the rest is joint expense to be divided in some way among all the traffic. The moment the traffic north becomes big enough to require extra trains, then the increment cost in that particular case is high, and at that moment increment cost for freight in empty trains now going south becomes small.

It follows that the increment cost which is necessarily incurred by a customer is usually very small, unless we can be *sure* that he is always the "straw that breaks the camel's back." The fact that he happens to cost a great deal should not be charged against him unless it is *always* going to require that extra expense to serve him; unless he, or his class, is *always* going to involve an expense, it is a joint cost and not an increment cost.

It is important to remember that for electric companies and for most public services, these joint costs are by far the most important portion of the total expense. It is seldom that it makes much difference to a railroad whether a single passenger does or does not get on the train. The expenses are the same whether he happens to be aboard or not. It is seldom that it makes any difference to an electric company whether a particular lamp or motor runs or not. It might be possible to compute the effect on the coal pile, but the effect on 90 per cent. of the expenses would be practically nil.

These joint costs must be divided in some way. Now, while the interests of the owner may appear to be temporarily opposed to those of the public on the question of the total of the costs, or the total of the joint costs, the owner, as such, has no interest that would lead him to divide a given total between the customers in any way contrary to the public interest.

The question is, how shall the joint costs be divided between the customers that jointly use the service?

One method is for the owner or manager to make arbitrary prices to each customer, but it is clearly of no advantage to the owner to charge different amounts under like conditions, and such discriminations are forbiden by law on the ground that they are either due to some improper influence on the manager against the interest of the owner and public, or else an error of judgment.

The simplest method is to select some unit, as ton-miles or kilowatt hours or number of telephone instruments served, and divide all costs in proportion to this unit. Here there is no difference of interests as between owner and public, in choosing the unit, but there will naturally be a difference as between portions of the public. A charge for hotel service by the European plan, helps one class of travelers as compared with a class that prefers the American plan, and so on. Whether an electric company charges per lamp connected, or per kilowatt hour, makes a great difference as between stores and residences, even if the rates are such that the owners of the electric company get the same return on their whole investment.

Further, it is perfectly possible to select more than one unit, or, if using a single unit, to make the rate for such unit different for different classes, as one rate for residences and another for business, or one rate for letters and another for merchandise.

Now, a class, just like an individual, might possess the power to bribe the managers or to exert improper influence, but this case is so rare that it is a fair assumption that when the government establishes one rate for letters and another for books, when a telegraph company makes one rate for regular telegrams and another for day or night letters, when a telephone company makes one rate for residences and another for business 'phones, when an electric company makes one rate for power and another for light, when a railroad makes one rate for passengers and another for freight, that these differentials are made in the interest of the public just as much as in the interest of the owners or the managers. Why, if the rate of return is fixed, should the owner (or manager) make class differentials unless for the purpose

of doing more business at the same rate of return, and is not this just what the public wants him to do? Or, even if these differentials do increase the rate of return, is not this for the ultimate public advantage by making possible reductions of price that would not have been possible otherwise?

Everybody, beginning with Uncle Sam, makes these classifications or class rates and, as we all know, the results are good. There is, however, a feeling that these classifications are necessary evils that should be allowed only as a temporary expedient. Simplicity is, of course, an advantage, if not gained at too great a cost, but a certain school of thought has lately taken to laying undue emphasis on the evil side of classifications of rates, without realizing the absolute necessity of the classification, or the great injury that would result to the public if it were given up.

In most cases these attacks on classification of rates have been merely a cover for attacks on the profits. If an agitator is trying to get an electric company or railroad company to reduce its rates as a whole, he may think that it helps his argument to accuse it of making improper discriminations; such cases of attacks on classification of rates do not deserve attention except from the officials involved and from the courts.

In other cases the attacks have been on discriminations that were in form only class rates, but which were really rebates to individuals or sets of individuals made for improper reasons. Such attacks are just and should succeed.

In a few cases the attacks are on the judgment of the managers, and such attacks may be honestly made and then deserve attention, since, if correct, they should lead to improvement, and if incorrect, the reasons should be made clear.

An article in "The Engineering Magazine" has appeared attacking certain electric rates. This article is clearly judicial in intention and in tone and means absolutely to be fair, and, further, it not only expresses the ideas of the author but represents pretty fairly ideas which are held by a number of people who have had occasion to study rates, without having been called on to put their theories into practice. When they have occasion to put their theories into practice, the rates deduced from their theories are usually modified on

the ground of expediency, so as to give fairly satisfactory results, but as this may not always be the case, and since the rates recommended in this article, and by others who work along the same lines, would be a serious injury to the public, this seems a good occasion to discuss the theory of division of joint costs represented by this article, to point out its weaknesses, and to discuss the methods of division of joint cost that will be to the greatest public advantage.

The theory or method that is receiving so much approval from the people who study rates without any responsibility as to the effect of the rates they recommend, is as follows:

First, analyze the total costs by a formula.

The unit may be the ton mile, or kilowatt hour, or a more complicated one: for a railroad the formula becomes—Total costs = ton miles × a + passenger miles × b; or, for an electric company, total costs = number of customers × a + kilowatt hours × b + kilowatts of demand × c.

Second, apply this formula to the service rendered each customer in order to determine his price. If the results do not give suitable prices, adjust the prices on the ground of expediency until they are right, or else try another formula.

Now, these various formulae or methods of analyzing costs, are most useful tools in considering what may be the effect of changes in the business, but it is obvious that a *complete* analysis involves a tremendously complex formula. A cost per ton mile does not take into account the fact that passenger service costs more per ton than freight service. A cost per kilowatt hour does not take into account the fact that underground service costs more than overhead, and besides these single items a complete formula would have not one or two but possibly hundreds of terms.

When there is free choice as to which formula shall be used, it is obvious that it is merely a question of trying different formulae until we get prices that suit us, and in this case the use of a formula is merely mental gymnastics.

At the moment, however, there is a call for electric companies to adopt prices as developed from a certain formula, sometimes known as the demand theory. Costs = number of customers × a + kilowatt hours × b + kilowatts of demand × c, and it is well to understand why this, as well

as any other formula, would be to the public's disadvantage unless by the merest chance it worked out right for all cases. The danger in the particular formula referred to, is that it has happened to be right so often that many people have got to depend on it, just as the hens thought that the sun rose only after chanticleer had crowed, or like the student who gave the longer days in summer as caused by the expansive power of heat.

No matter which formula we use for analyzing costs, it is still true that most of the costs are joint costs not necessarily incurred by any particular customer or customers.

Now, if these joint costs are divided in one way according to some formula, there may be still another division which may give better results for the public.

If the formula is a sacred one we cannot go behind it, but if not sacred, what test shall we apply to see if it gives the best results?

The best result is when the burden on customers is least; *i. e.*, when we get as much business as possible among which to divide the joint costs so that the burden on each customer shall be least.

How shall we fix prices this way?

If we had a growing business, without any existing rates, we should find it difficult to say how we should start, but we cannot imagine a business operating without some rate to start with, and if we have some business and some rate to start with, all we have to do is to see if some change of rates will not give better results and to keep on trying until we can make no further improvement.

Take existing rates. They produce an income which is either less than a fair return, a fair return, or more than a fair return.

Now, if the return is less than fair, a new rate applicable only to new business that could not otherwise be obtained, should return something towards joint costs, and will be of no harm to existing business and will be an improvement. If the return is just a fair one, a new rate that produces new business over which to distribute joint costs will not hurt existing business, but will make possible a reduction of rates.

If existing rates show more than a fair return, a reduction

should be made, but again, if a reduction so as to produce new business is made, further reduction becomes possible.

In any of the cases, it is obvious that the new rate should take as much of the joint costs as it will stand, and this is clearly no injury to the new business, because it need not take the supply unless it wants to, and will not unless it gets some advantage. On the other hand, if new business is asked to share the same proportion of joint costs that is being paid by the old business, it may not be secured at all, and then will not pay anything towards joints costs, instead of paying something.

Take the article in "The Engineering Magazine"; take the illustration there given. The figures there given say that the central station operating costs are 1 cent per kilowatt hour (the real cost is usually less). The general expenses are taken at 2½ cents per kilowatt hour. This figure for general expenses probably includes all accounting and distribution expenses, such as maintenance of lines, etc. The article does not give any figure for the fixed charges on the central station, but says that they are three times what they would be for an isolated plant, and later gives the fixed charges of such a plant as 2 cents per kilowatt hour, which would make the fixed charges for a central station 6 cents per kilowatt hour, and would make the total central station costs 9½ cents per kilowatt hour.

Then the costs of an isolated plant are given as—operating cost 1 to 1½ cent per kilowatt hour; fixed charges 2 cents per kilowatt hour, and general expenses nothing, making a total of 3 to 3½ cents per kilowatt hour.

It is, of course, absurd that an isolated plant has no general expense, and that supervision and management expenses do not exist, and that such services where tendered should not be included in the cost.

The Engineering Magazine article then wants us to infer from the above that the central station cannot by any possibility sell electricity at 3 cents and make its expenses.

The costs for the central station, however, are the average costs, made up of all sorts of expenses, and because they may average 9½ cents it does not mean that each new customer will also cost 9½ cents. Each new customer may add something to the total costs, but this addition will have no relation to the average cost of serving the old customers.

For instance, I recently learned of a case where a central station is supplying to all its customers about 6,000,000 kilowatt hours, with an operating cost at the station of about $60,000, an average cost of 1 cent per kilowatt hour.

Its general and distribution expenses of all sorts were about $180,000, making about 3 cents per kilowatt hour; its fixed charges were about $180,000, making about 3 cents per kilowatt hour; the total average cost or price for all its output was therefore about 7 cents per kilowatt hour. This price was collected from its customers at different rates varying from 3 cents to 11 cents per kilowatt hour.

This station then had placed before it a proposition for supplying a single new customer with 4,000,000 kilowatt hours annually. In order to supply this customer all it had to spend in the way of investment was about $30,000 for lines, ducts, etc., and for the increased capacity at the station.

This, however, was not quite fair, because the supplying of this customer used up some capacity which was idle, and made it necessary to spend another $30,000 very shortly, which otherwise would not have been spent.

The real increase in investment made necessary by this customer was then about $60,000, and to make sure that this was reasonable they got out the figures as to what the increased investment would be if they should take on several more customers like this one, and found it less than $60,000 each.

This is a very important point. If a rate can be established for a single customer, and a different rate for the next one, then the increment cost can be figured for each.

If, however, a rate is established for a class, we must figure what is going to be the whole result for years ahead, when not one but many customers of the class are added.

To return to our example. 15 per cent. on $60,000 meant $9,000 a year increase in fixed charges.

The operating expenses had been $60,000 for 6,000,000 kilowatt hours, and they estimated that for 10,000,000 kilowatt hours the operating expenses would only be $85,000—an increase of $25,000.

The general expenses had been $180,000, but this single large customer, or other customers like him, would hardly add

anything to the general expenses, though they put down an increase of $1,000.

The net result of adding this large customer, and of still other customers proportionately, was, therefore, an increase in the expenses of $9,000 fixed charges; $25,000 operating, and $1,000 general, or a total of $35,000, which, applied to the 4,000,000 kilowatt hours of use gave approximately 9 mills per kilowatt hour.

It was stated that this customer could make his own electricity for about $64,000 a year, or 1.6 cents per kilowatt hour, and the central station to secure his service made a price that came to $60,000 a year, or 1½ cents per kilowatt hour, and the difference between the $60,000 that the customer paid and the $35,000 that it cost to serve him left a contribution of $25,000 toward the net revenue.

This did no harm to the customers who previously had been paying 3 to 11 cents per kilowatt hour, and as a matter of fact, later enabled the company to make a reduction to these customers, which it would otherwise not have been able to make.

In a case like this we naturally feel that a new customer should contribute as much as possible to joint costs; *i. e.*, should be made to pay, in unpopular phraseology, all his traffic will bear, even if we do not charge him as much as we charge the others. Now, in order to determine what he can actually afford to contribute towards joint costs, it is necessary to figure what it will cost him to make it himself, and in most cases of customers like this the things which determine his costs are his demand, his consumption, and his size; in other words, using as a basis to figure his costs, the demand formula above referred to. Hence, in publishing a rate to attract these customers, it is natural to make it on a demand basis, so that each shall pay as much as possible of the joint charges and reduce their burden on others.

But note: While the demand system furnishes a measure of the total station costs it is not for that reason that we use it in making prices. We use it in making prices because it furnishes a measure of the value of the service to the customer and if in any particular case the demand system did not furnish this measure we might use some other measure in order to apportion to him as much as possible of the joint costs, so that the supply to him should be of the greatest benefit to the other customers.

Now, this explains in part, at least, the popularity of the so-called demand theory. Everybody uses the analysis of costs into demand and output charges, and finds it extremely useful, first, when applied to the central station costs to determine the effect of changes upon those costs, and, second, when applied to the customers to determine the price which will make the supply to them result in the greatest benefit to the customers as a whole.

Even when there is no question of the customer making his own electricity, the demand theory still is apt to furnish a measure of how much the new business can contribute to joint costs.

For instance, a customer with a few lamps used long hours will take the trouble to equip himself with gas and maintain Welsbach burners, unless he gets a fairly low rate per kilowatt hour; while another customer, using the same amount of electricity, but on a large number of lamps, can afford to pay a higher price per kilowatt hour, rather than trouble with the gas outfit. It is, of course, better for both customers to be supplied than for one to use gas, and let the other pay all the joint costs.

The demand theory is very apt to give prices that will be best for all, but this is purely because it happens to fit certain classes of customers. The fact that in some cases the best prices can be figured from a particular cost formula, does not prove that the same figuring will give a correct result when conditions are changed.

To return now to the case of the large customer, there is always difficulty in understanding why it is that a large customer can be supplied at so much less than the average price, but here is another analysis which may make it clear.

The central station could build a new small station for a customer close to his mill, and a duplicate of his plant, and by running it exactly as he would run his plant could meet his costs exactly. In such a case it is clear that the old station costs would be 7 cents and a proper price to old customers 7 cents; cost at new station 1-6/10 cents, and the proper price to the new customer 1-6/10 cents. Then when we combine them and run them as a unified proposition, the situation is still the same, and the cost of each does not become the

average, any more than a short man could become taller by enlisting in a company of soldiers whose height averaged more than his.

This point about building a small station close to a customer is a very essential one to remember. The central station can *always* meet the price of the isolated plant, because it can build an exact duplicate of the isolated plant and run it as the customer would run it and meet the price, and then, as a next step, the central station by combining the loads can effect a saving and make a profit. In any case it cannot lose by selling to the customer at what it would really cost the customer to supply himself, because in the worst case it operates exactly as the customer would have operated.

We contend that there should be no isolated plants from the standpoint of economics. Why, then, are there any isolated plants? The reasons are as follows:

Sometimes the central station does not know its business. The costs of an isolated plant may be said to be 3 cents, but the central station may refuse to supply the service at less than 5 cents.

Sometimes the isolated plant does not know its business. The real costs of the isolated plant may be 3 cents, and the central station may offer a supply at 2.9 cents, but the engineer may report that the plant cost would be only one-half cent, and he secures a commission, or at least a job.

Sometimes the owner of the isolated plant is running it for his health as a hobby or for amusement. The central station cannot very well make a price that will recognize such conditions.

Occasionally the case may present itself where it is really economical to generate part of the electricity at the customer's premises and part at the central station, as when the customer may have water power available. If this amount at any given time corresponded exactly to the customer's requirements, then for this time there would be no advantage from the central station connection, but practically always some of the electricity could be economically supplied from the central station, or else the water power plant could sell some to the central station.

Sometimes there are laws that require different labor or other conditions, when a public service corporation pays the bills than when the private owner hires the men, but all these are more or less incidental conditions that will finally disappear. Any savings or contribution to the net revenue of the central station are ultimately for public advantage, because whatever increases the profit of the central station brings earlier reduction of rates to its customers as a whole. Hence, a central station should make rates that will get all the business, and while making the rates just low enough to get the business, that could not otherwise be secured, should make them no lower than necessary and in no case below increment cost.

But suppose we adopt this theory. Is it not the value of service? Is it not after all the theory of charging what the traffic will bear?

So far as these big customers are concerned, perhaps it is, or rather it is not charging what the traffic won't bear, not charging them any more than their costs would be with independent plants, but securing all that their traffic will bear for the reduction of the burden of joint costs to all customers.

Now, when we apply this theory to small customers, we are met with the question of regulation, and the answer is this. An electric company, or any public service, must make its rates lower even than they would have been under free competition.

The theory of value of service applies even in this case. The value of electric light service to anyone is not what he would pay a particular company for electric light rather than go without electric light at all, but what he would pay that particular company for the service rather than get an equivalent service in some other way. The value of the service is never above what one of the competitors offers it at, and regulation of prices is merely to determine what the value of the service from the company in question would have been if no monopoly had been granted; in other words, what the company would have charged, in the long run, if subject to competition.

Whenever the return on investment is higher than is reasonable and equitable, competition will naturally spring up, and the authority that grants the monopoly requires that there shall be a reduction of rates, applicable to those classes

whose price would have been reduced by means of such competition. Subject to this exception, each price should be such as to produce the greatest amount of business and make the burden of joint costs least; and the final result will be obtained by basing all rates either on actual value of service, or on what this value would be under free competition. This results in practice in a simple, general rate such as obtains in most of our cities, with special classifications for power use, and for large customers, etc.

It will be for the interest of owners, as well as of the public, to adjust rates along these lines, and if rates are made public and open to all alike under like conditions, and so long as these conditions are made in good faith and without ulterior motive, any such proper discrimination in rates is justified and should inure to the advantage of the public as a whole.

In practice the method here advocated of determining rates works simply, even if it means that the final figure is determined more by the business judgment of the manager, than by the reports of the accountants.

There are some tests to be applied to any particular revision of rates, that will perhaps make this idea more popular. We always begin with a rate and a business, not necessarily the business of the last year, but the revenue that is expected by the investor to be produced by the rates as established.

The question is of a change. Formulae, theories, etc., may be used to suggest a change, or the new figures may be suggested purely by guess. Each suggested change is, in turn, tested by the following criteria:

First, is it a change that would have been produced in the long run by free competition among companies covering the whole territory? If so, it should be made voluntarily by the owner, or, if not so made, should be forced on him. This test, as to what the rates would have been under free competition, is of course a very difficult one for an accountant to apply, but it is not necessary that it should be applied exactly, and in fact, if applied exactly, would not be entirely satisfactory. For instance, free competition in electric service would probably result in low rates in the centers of cities, and high rates in the suburbs, instead of uniform rates. In

this case the public probably acts wisely in requiring uniform rates over the territory, but whether it does or not hurts the public more than the owners, so long as the profits are left sufficiently high so as to continue to attract new capital into the field, and into similar fields that to-day appear as risky as the enterprise under discussion looked when it started.

Second, is it a change that will produce new business that will furnish some additional contribution to joint costs? If so it should be made in the interests of the business as a whole.

Third, is there any other change that will produce a greater contribution towards joint costs?

Now, the answers to these last questions also furnish a test as to whether a rate is discriminating, in the sense in which discrimination is unpopular, because they ask, "does the change produce *new* business?"

The change in rates may apparently produce some new business, but the business on the new rate may be business that was formerly on the old rate. In such case it is merely a transfer from the old rate, and there is no increase in business, but instead, a decrease in contribution to joint costs, and in such case the new rate does not stand the test. This will often be the case when the customers on the new rate are competitors of those on the old rate. In railroads this occurs much more frequently than in electric companies. If the rate to Jonesville is lowered that may merely shift business to Jonesville away from Smithtown, without increasing the total. If Smith and Jones are competitors, a low rate to Smith may merely mean that Smith does more business at the expense of Jones, but the total business and the contribution towards joint costs are not increased. If, however, the difference in rates is not between competitors, no business is shifted.

One electric company made a special classification of motors. If this had been General Electric versus Westinghouse, it would have meant merely a transfer from one kind of motor to the other and no new business. Instead, the classification was between elevator motors and ordinary motors, reducing the price to ordinary motors. Here the change brought in more ordinary motors to reduce the burden, but did not affect the business in elevator motors until finally the reduction in joint costs warranted a general reduction which they

would not otherwise have obtained. Hence, the discrimination between motors was assumed to be justified in this case.

Even between competitors a differential may still produce new business that is not obtained at the expense of old business. The big store that can put in a plant competes with the small store, but the lower rate to the big store (unless seriously below what it would cost the big store from its own plant) does not hurt the small store. The big store does not, by reason of buying electricity, take any more business from the small store, than it would if the big store had its own plant.

One rate for residences and one rate for stores would never transfer business and would seldom be open to criticism. On the other hand, one rate for two family houses, and another for single houses, might transfer business from one to the other, and in general might be undesirable. One rate for ice-making, and another rate for water pumping would almost never transfer business; hence is fully justified. One rate for drug stores and another for saloons, would be apt to transfer business, and would have to be closely scrutinized. One rate for theaters and another for other amusement places, would be apt to be discriminating, because it would be apt to transfer business, and a rate for newspaper offices different from ordinary printing offices, would again be subject to suspicion. On the other hand, a rate for hotels might be different from a rate for factories, without much chance of any transfer of business.

The point of making these illustrations is to show how the methods advocated agree with our general ideas. In fact the following is usually a pretty safe guide when considering whether a differential is justified:

If the differential is between customers or classes who compete with each other, the burden of proof should be on those who propose or advocate the differential, and the differential should not be allowed unless it is shown that it is necessary, and no greater than necessary. The differential between large and small customers is of this nature. It is necessary, and in fact it would be better for the small customers, if the differential should be made larger than it is now, so as to get the big users to contribute something towards joints costs instead of nothing, as happens when they do not

use the service; but it should always be watched carefully, because any error in adjusting it will merely transfer business from one class to another without really producing any new business.

On the other hand, for a differential between classes which do not compete with each other, the burden of proof should be on those who object to the differential; since, if the classes do not compete, the differential will not transfer any business, and any increase in business will be genuine and for the advantage of all.

The following rules will show how the foregoing methods can and should be applied.

For the company—adjust the rate to the various classes so as to get the greatest volume of business among which to divide joint costs, and in order to do this, first make sure that no class is supplied at a loss, and that each class bears as much as it can contribute (or would have paid under free competition) of the joint costs. This means make the rates proportional to the value of the service, less the savings due to monopoly.

This should result in a single general rate for the general public, at least as low as would have obtained under free competition.

It should result in class rates for power, street lighting, charging of batteries, cooking, etc., lower in many cases than the general rate, and should result in differentials for large customers, all of these class rates and differentials being only as low as necessary in order to get the business.

The differentials for large customers should be low enough to get the business now done by isolated plants.

For the public—allow the company to make any change it likes as between customers or classes who do not compete with each other.

When a change is proposed that makes a difference between customers or classes that do compete with each other, allow the change only when it is clear that the result will really produce new business, and not merely transfer business as between competitors.

When the rates produce more than a fair return, provide for reducing the rates to those classes which would have obtained a reduction if competition had been free.

This is the line along which companies are now developing. The only weak point in their present situation is that they are not making the differentials in favor of large customers (and of certain uses, such as cooking, etc.), enough to get the business, and this requires the small customers to pay more towards joint costs than would be necessary if the rates for big customers were made low enough to shut down every isolated plant, where the owner knew his costs and was not running it for his pride or his amusement.

REFERENCES

RATES

611—Flat Rates.

Flat-Rate – Lighting Analyses, editorial, Electrical Review, Feb. 8, 1913, p. 287.

States that though objections are made to flat rates, this method of charging is to be reckoned with among ways of popularizing the use of electricity in the home and office. A usual charge is one cent per watt per month, the consumer having the privilege of using a stated connected load freely, provided he does not exceed the number of outlets specified in his contract. Wherever this method is used the company should install meters on each class of service covered, and thus obtain a check on the energy consumption of the different installations.

In this way the energy taken can be determined for different seasons of the year, month by month, and the actual rate yielded per kilowatt-hour determined for future reference. Records of this kind are valuable in comparing the earnings of various classes of service, testing the fairness of the flat rate under stated conditions, and contrasting the performance of measured feeders, with sections of the distribution system supplying only flat-rate customers. The actual rate received on the basis of a charge of one cent per watt per month, varies according to the use made of the contracted load, and may range from 8 or 10 cents, or even more, to less than 2 cents in cases where the lamps are turned on and left burning for excessive periods. Even if the services are protected by automatic devices which keep the demand down to a stated maximum, the central-station company can well afford to find out what its flat-rate consumers are doing with their connected loads, and the simplicity and low cost of doing this with a few well placed meters should not escape the attention of the manager who desires to really know the operations of his plant.

62—Character of Service.

Analysis of Central-Station Conditions in a Small Town, illustrated article, Electrical Review, 4½ pages, Feb. 8, 1913, p. 291.

Gives tables and curves showing full and interesting data from a very successful plant. The economies and advantages of combining ice-making and steam heating with an electric plant are well known, but seldom are figures such as are given in this article available for publication. The operating features of the plant in question are worthy of a detailed analysis, as they indicate the possibilities for central stations in small towns.

625—Feature Rates.

Rates for Garaging Electric Vehicles, Discussed at Chicago, Electrical Review, Feb. 8, 1913, p. 289.

Claims rates charged by a new garage in Chicago, are the most equitable yet put into practice. The charge is here divided into two portions; a fixed charge of $20 per month per vehicle for storage, adjustment and oiling, and an additional varying amount for charging. This second portion provides for power at the rate of 4.5 cents per kilowatt-hour for the first 300 kilowatt-hours, and 4 cents after that amount has been consumed.

Meter readings checked with miles give a very good basis for figuring out the ton-miles, or at least allow the car-miles to be accurately computed.

INVESTMENT AND RETURN

315—Intangibles — Going Value.

Going Concern Value, editorial, Public Service, Feb., 1913, p. 42.

States that practically all authorities agree that a public utility business in active operation, has an element of value distinct from the sum of dollars and cents represented in its physical plant, yet has nothing to do with "franchise" value, and is not identical with "good will" value as known in mercantile business. This "going concern" value is now being recognized and defined more explicitly than heretofore, and the recent decision by the New Jersey Board of Public Utility Commissioners in the Public Service Gas Company rate case, when it was definitely expounded that even though "going concern" value had been built up in the past out of rates exacted from consumers, it nevertheless must be admitted as part of the present legitimate property of the public utility, is a useful precedent for clarifying opinion on this point.

51—Cost of Service.

Decision of the Board of Railway Commissioners for Canada, in the matter of the Montreal Telephone Rates. Public Service Regulation, 7 pages, Jan., 1913, p. 45.

This is a decision in the matter of the complaint, by the City of Montreal, and by four subscribers, of the rates and service of the Bell Telephone Company, and gives in some detail an analysis and discussion of the principles of valuation, reproduction cost compared with book value, apportionment of investment and revenue, with comparison of methods of determining depreciation, and a careful study of discrimination.

PUBLIC SERVICE REGULATION

2—Public Service Regulation.

Model Utility Legislation, and Meeting of the National Civic Federation, editorial and article, Electric Railway Journal, 6 pages, Feb. 1, 1913, p. 179 and p. 210.

A brief comment on the report of the Department on Regulation of Utilities of the National Civic Federation, calls attention to the language of the report advocating "reasonable public regulation", and states that the choosing for commissioners of men of high character and ability, will be more important, for this end, than the wording of the laws.

A mention of the work and aims of the National Civic Federation was given in 2 R. R. 279, under the heading Co-operation, and in 2 R. R. 283, under Public Service Law. At the annual meeting of the Federation in New York on Jan. 28 and 29, reports were presented on Regulation of Interstate and Municipal Utilities, Workmen's Compensation and Industrial Mediation. In the first of these the purpose of the model utility law is described. Some interesting conclusions to utility companies are

> Competition, relied upon in the earlier days to protect supposed public interests, has failed completely. . . .
>
> The department believes not only that public regulation is preferable to public ownership and operation, but that public ownership and operation may be deferred only by reasonable public regulation. . . .
>
> The state owes it to its quasi-public agencies performing the transportation, gas, water, electric, telephone and other public services, no less than to the public itself, to free public utilities from the baneful influence of local politics. The state must see to it that the common law rule of reasonableness and non-discrimination is applied fully and in all respects fairly to these industries.
>
> The department on regulation of interstate and municipal utilities, was established to evolve, if possible, a working plan, adaptable in the main to every part of the country, whereby public utilities may be regulated by the state wisely, and in the interests alike of the public and of themselves.
>
> If the department succeeds in impressing the country with the desirability of establishing efficient, able, high-minded and conscientious commissions, with ample facilities and powers to regulate the relations of public utilities with their patrons and the public, it will have accomplished a worthy purpose.

223—Rate Regulation.

BALTIMORE RATE DECISION, editorial, The Gas Age, Feb. 1, 1913, p. 125.

Reviews the decision by the Maryland Public Service Commission in the Consolidated Gas, Electric Light and Power Company rate case, given in 2 R. R. 262, and states that the opinion proves reason and honest intention on the part of Commission, and its handling of the difficult problem of over capitalization is commended as eminently fair and broad minded.

82—State Regulation of Municipal Utilities.

THE COMMISSION QUESTION IN ILLINOIS, editorial, Public Service, Feb., 1913 p. 41.

Quotes the opinion of the chairman of the special commission appointed by the Illinois legislature to investigate the need of a state public service commission, that the Chicago City Council is incompetent to deal with any one of the public utilities operating in that city, and adds that Chicago is not alone in this respect, as almost every city in the country is in the same predicament, not because members of councils are not intelligent, but because they have had no training in public utility questions, and moreover the attempts at local regulation of utilities have always been nullified by politics.

A bill is now being drafted, to be introduced in the present legislature, creating a state commission similar to those exercising regulation in other states, and providing for the division of the state into zones, giving Chicago two zones, one commissioner to be appointed from each zone, and the establishment of permanent offices both in Chicago and Springfield.

GENERAL

132—Protection from Competition.

Rate Wars Against Public Policy, Public Service Regulation, 2½ pages, Jan., 1913, p. 12.

This gives that part of the decision of the Wisconsin Railroad Commission in the Milwaukee electric companies rate case, covering their opinion on competition in the public utility field, abstracted in 2 R. R. 175.

132—Protection from Competition.

"Cheap Electricity for All," a 28-page pamphlet, issued by the Municipal Ownership Publishing Company, 17 East 38th Street, New York.

This is an answer to the statements made by the Conservation Commission of the State of New York, in its pamphlet under the above title, on the subject of the utilization of the waste water power of the state, referred to in 2 Rate Research 58.

83—Municipal Ownership.

Application of the Rochester Railway and Light Company, to exercise franchise in the village of Charlotte. Decision of the Public Service Commission (2nd D. New York) granting the application.

The residents of Charlotte held a special election, and voted to sell the municipal electric plant to the Rochester company for $12,700.

83—Municipal Ownership.

Principles and Methods of Municipal Trading, by Douglas Knoop, reviewed in Stone and Webster Public Service Journal, 3 pages, Jan., 1913, p. 1.

The editorial review of this new book by the lecturer on economics in the University of Sheffield, England, pronounces it the best work on the subject that has yet appeared in English, denoting the most painstaking study, an impartial attitude of mind, and the soundest knowledge of everyday business principles. The author reaches the conclusion, after a cold scientific scrutiny of every aspect of municipal operation of utilities, that the wisdom of such undertakings is "not proven," and points out further that the subsidizing of them from taxes, can not be either ethically or economically justified.

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Rate Research

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For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

129— DEFAULT IN PUBLIC SERVICE— DISCRIMINATION

DISCRIMINATION IN RATES AND SERVICE, a 149 page pamphlet, issued by the DEPARTMENT ON REGULATION OF UTILITIES OF THE NATIONAL CIVIC FEDERATION, is one number in its series compilation of the public utility regulation laws of the United States.

The majority of legislative enactments against discrimination were passed in regard to railroads. Concerning electrical discrimination, the following references cover the legislative sources, and some typical expressions of the law on the various points are given.

A. Charges for Like Service Must be Uniform, and Same as Published Schedules.

Typical sections:

> No gas corporation, electrical corporation or municipality shall directly or indirectly by any special rate, rebate, drawback, or other device or method, charge, demand, collect or receive, from any person or corporation, a greater or less compensation for gas or electricity or for any service, rendered or to be rendered, or in connection therewith, except as authorized in this chapter, than it charges, demands, collects, or receives from any other person or corporation, for doing a like and contemporaneous service with respect thereto under the same, or substantially similar, circumstances or conditions.
>
> It shall be unlawful for any public utility to charge, demand, collect or receive a greater or less compensation for any service performed by it within the state or for any service in connection therewith than is specified in the printed schedules.

Arizona.....Session Laws, 1912, ch. 90, sec. 17 (b)
California.....Stats., 1911, ch. 14, sec. 17 (b)
Maryland.....Laws, 1910, ch. 180, sec. 31½

EDITORIAL NOTE.—All indented matter is direct quotation.

Michigan.....Pub. Acts, 1909, No. 106, sec. 7
Nevada.....Stats., 1911, ch. 162, sec. 12
New York.....Laws, 1910, ch. 480, sec. 65 (2)
Ohio.....Laws, 1911, No. 325, sec. 16
Oregon.....Gen'l Laws, 1911, ch. 279, sec. 63
Rhode Island.....Acts, 1912, ch. 795, sec. 39
Washington.....Laws, 1911, ch. 117, sec. 31
Wisconsin.....Laws, 1907, ch. 499, sec. 1797m-89

B. Facilities in Exchange for Less Compensation Prohibited; Exceptions.

Typical section:

It shall be unlawful for any public utility to demand, charge, collect or receive from any person, firm or corporation less compensation for any service rendered, or to be rendered, by said public utility, in consideration of the furnishing by said person, firm or corporation, of any part of the facilities incident thereto; provided nothing shall be construed as prohibiting any public utility from renting any facilities incident to the transportation of persons or property by street railroad, or to the production, transmission, delivery or furnishing of heat, light, water or power, or the conveyance of telephone messages, and paying a reasonable rental therefor, or as requiring any public utility to furnish any part of such appliances which are situated in and upon the premises of any consumer or user except telephone station equipment upon the subscriber's premises, and unless otherwise ordered by commission meters and appliances for measurements of any product or service.

Oregon.....Gen'l Laws, 1911, ch. 279, sec. 64
Wisconsin.....Laws, 1907, ch. 499, 1909, ch. 213, sec. 1797m-90

C. Discriminations, Undue Preference or Disadvantage Prohibited.

Typical section:

If any public utility shall make or give, any undue or unreasonable preference, or advantage, to any particular person, firm or corporation, or shall subject any particular person, firm or corporation, to any undue or unreasonable prejudice, or disadvantage, in any respect whatsoever, such public utility shall be deemed guilty of unjust discrimination, which is prohibited and declared unlawful.

Arizona.....Session Laws, 1912, ch. 90, sec. 19
California.....Stats., 1911, ch. 14, sec. 19
Maryland.....Laws, 1910, ch. 180, sec. 31½
New Hampshire.....Laws, 1911, ch. 164, sec. 7 (d)
New Jersey.....Laws, 1911, ch. 195, sec. 18(d)
New York.....Laws, 1910, ch. 480, sec. 65 (3)
Ohio.....Laws, 1911, No. 325, sec. 17
Oregon.....Gen'l Laws, 1911, ch. 279, sec. 65

Rhode Island.....Acts, 1912, ch. 795, sec. 40
Washington.....Laws, 1911, ch. 117, sec. 30
Wisconsin.....Laws, 1907, ch. 499, sec. 1797m-91

D. To Solicit, Accept or Receive Any Rebate, Concession or Discrimination Prohibited.

It shall be unlawful for any person, firm or corporation knowingly to solicit, accept or receive any rebate, concession or discrimination in respect to any service in, or affecting, or relating to the production, transmission, delivery or furnishing of heat, light, water or power, or the conveying of telephone messages, within this state, or for any service in connection therewith, whereby any such service shall, by any device whatsoever, or otherwise, be rendered free, or at a less rate than that named in the published schedules and tariffs in force as provided herein, or whereby any service or advantage is received other than is herein specified. Any person, firm or corporation violating the provisions of this section shall be deemed guilty of a misdemeanor, and on conviction thereof shall be punished by a fine of not less than fifty dollars nor more than one thousand dollars for each offense.

Oregon..... Gen'l Laws, 1911, ch. 279, sec. 66
Rhode Island.....Acts, 1912, ch. 795, sec. 41
Wisconsin.....Laws, 1907, ch. 499, sec. 1797m-92

E. Free or Reduced Rate or Special Service Allowed as Specified.

Typical sections:

Nothing in this act contained shall prevent any public utility or railroad, from granting the whole or any part of its property, for any public purpose, or granting reduced rate or free service of any kind, to the United States government, the state government, or any political division or subdivision thereof, or for charitable purposes, or for fairs or expositions, or to any officer or employe of such public utility, or railroad, or his family, and all contracts and agreements made or entered into by such public utility or railroad for such use, reduced rates or free service, shall be valid and enforceable at law.

With the approval of commission, any public utility may exchange its service for the service of any other public utility, furnishing a different class of service.

Kansas.....Laws, 1911, ch. 238, sec. 12.
Ohio.....Laws, 1911, No. 235, sec. 75
Oregon.....Gen'l Laws, 1911, ch. 279, sec. 63
Rhode Island.....Acts, 1912, ch. 795, secs. 42 (a) (b) (d)

Some Specific Provisions Not Found in Similar Form in the Laws of Other States Are as Follows:

Provided however, that the provisions of this section shall not be taken to require absolute uniformity in the charges made and demanded by public utilities, when the circumstances render any lack of uniformity reasonable, ... and provided, further, that said provisions shall not be taken to prohibit a public utility from establishing differential rates, or a sliding scale, for the automatic adjustment of such charges, if said rates or sliding scale, subject to the approval of commission, shall be reasonable and just.

New Hampshire.....Laws, 1911, ch. 164, sec. 7 (d)

Nothing in this act shall be taken to prohibit a gas, electrical or water company, from establishing a sliding scale of charges, whereby a greater charge is made per unit, for a lesser than a greater quantity, for gas, electricity, or water, or any service rendered or to be rendered.

Washington.....Laws, 1911, ch. 117, sec. 32

Nothing in this act shall be construed to prevent any gas, electrical or water company, from continuing to furnish its product, or use of its lines, equipment or service, under any contract or contracts in force at the date this act takes effect, or upon the taking effect of any schedule or schedules or rates subsequently filed with commission, as herein provided, at the rates fixed in such contract or contracts; provided that commission shall have power in its discretion to direct by order that such contract or contracts shall be terminated by the company party thereto, and thereupon such con tract or contracts shall be terminated by such company, as and when directed by such order.

Washington.....Laws, 1911, ch. 117, sec. 34

No public utility or any agent or officer thereof, or any agent or officer of any municipality constituting a public utility, shall offer or give for any purpose to any political committee, or any member or employe thereof, to any candidate for, or incumbent of, any office or position under the constitution or laws, or under any ordinance of any municipality of the state, or to any person at the request, or for the advantage of, all or any of them, any frank or any privilege withheld from any person, for any product or service produced, transmitted, delivered, furnished or rendered, or to be produced, transmitted, delivered, furnished or rendered, by any public utility, or the conveyance of any telephone message or communication, or any free product or service whatsoever.

No political committee, and no member or employe thereof, no candidate for, and no incumbent of, any office or position under the

constitution or laws, or under any ordinance of any town or municipality of the state, shall ask for, or accept, from any public utility, or agent or officer thereof, or any agent or officer of any municipality constituting a public utility, or use in any manner, or for any purpose, any frank or privilege withheld from any person for any product or service produced, transmitted, delivered, furnished or rendered, or to be produced, transmitted, delivered, furnished or rendered, by any public utility, or the conveyance of any telephone message or communication.

Any violation of any of the provisions of this section shall be punished by imprisonment in the state prison for not more than five years, nor less than one year, or by fine not exceeding $1,000, nor less than $200.

Wisconsin.....Laws, 1907, ch. 499, sec. 1797m-88 (1) (2) (3)

COMMISSION DECISIONS—NEW YORK

129—Default in Public Service—Discrimination.

Complaint of the Attica Water, Gas and Electric Company (Attica, N. Y., pop. 1,869) against the Alden-Batavia Natural Gas Company, alleging unjust discrimination, by refusal to supply service. Decision of Public Service Commission (2nd D., N. Y.) ordering the service to be supplied. Jan. 21, 1913.

This is a case where two companies, The Attica Water, Gas, and Electric Company, and the Attica Natural Gas Company, have been competing in the business of supplying natural gas in the Village of Attica for several years.

The wells owned by these companies have diminished greatly in production, and in November, 1911, one of the competing companies entered into a contract with the Alden Batavia Natural Gas Company, a large concern owning 78 wells, for a supply of natural gas in any amount needed, at the rate of 30 cents per thousand. But this corporation has refused to supply the second of the competing companies, which has thereby been unable to retain its business, and now petitions the Commission for an order to compel the Alden Batavia Company to supply it on equal terms with its competitor. The Commission, after hearings, issues this order.

The pertinent paragraphs of the decision are:

> The [Alden Batavia Company] argues that the making of the contract between it and the Attica Natural Gas Company, has resulted in reducing the price of gas to the public, from $1 per thousand to 50 cents per thousand, and that the action of the petitioner in asking for a similar contract will in some manner "exclude or impede competition."

We fail to see the force of this contention. The result of the obtaining, by the petitioner, of a contract similar to that of the Attica Natural Gas Company, would be to enable it to compete with the last named company in selling gas, and the rate to the consumer might possibly go as low as 30 cents per thousand, the cost of the commodity to each competitor. Such a rate war would be undesirable, but it would undoubtedly result in temporary advantage at least to the consumer. It is not to be encouraged, and would not be, were this a case of an application on the part of a new company, to enter the field. It must be remembered, however, that in this case the rival companies are now in existence, and in competition, and that the favorable contract of one is likely to crush out the life of the other, so far as gas service is concerned. The evils attendant upon a rate war are already present, and acute, so far as the petitioner is concerned. It has lost most of its gas business since this contract went into effect, and seems likely to lose it all in the near future. . . .

It may be said that the obtaining by the petitioner of a contract similar to that of the Attica Natural Gas Company, by which it may obtain gas at 30 cents per thousand feet, will put the petitioner in a position to inaugurate a rate war, and that the usual consequence, disastrous to the competitors, and to the public, will ensue. This, as has been stated, might be a good reason for refusing to a new company, permission to go into the Attica territory, but with both companies now there, and in active rivalry, it is not to be presumed that the competition will be more keen in the future, than it has been in the past, when the sources of supply from local wells owned by each, have been, so far as can be judged from the evidence, practically similar. To urge this objection at this stage in the proceedings, is to urge it solely against the petitioner, who must go out of business, and lose its investment in its gas distributing system, if it can not obtain gas on an equal footing with its competitor. . . .

It is the opinion of the Commission that the respondent, the Alden-Batavia Natural Gas Company, should be ordered and directed to enter into a contract with the petitioner, the Attica Water, Gas and Electric Company, for the furnishing of gas substantially upon the same terms and conditions as those contained in respondent's contract with the Attica Natural Gas Company, and to give a connection at the village line to petitioner, on or before the 21st day of February, 1913, and to furnish the petitioner on or before that date, with gas at such point of connection at 30 cents per thousand feet, on the same terms and conditions as are set forth in the contract between respondent, and the Attica Natural Gas Company, with the following exception, to-wit:

It appears from the testimony that the petitioner at the present time makes use of gas from its own wells as fuel to generate electricity. Whatever gas is hereafter used for this purpose by the petitioner, must be obtained from its own wells, or purchased from the Attica Natural Gas Company at its regular rates. In taking gas used for these purposes, the petitioner is a regular consumer and entitled to no consideration other than would be given to any other consumer located in the Village of Attica in the same class with itself. Whatever gas is furnished the petitioner by respondent under the order of this Commission, must be used for distribution purposes only, and should be separately metered and accounted for, through mechanical devices which can be easily and readily installed.

There was some testimony taken, and statements made, tending to show that petitioner's financial condition was such that security for the performance of the contract should be given by it. If the respondent deems such security necessary, the contract hereinbefore referred to should be guaranteed by adequate and proper security.

COMMISSION DECISIONS—MASSACHUSETTS

223—**Rate Regulation.**

Complaint against the Haverhill Gas Light Company (Haverhill, Mass., pop. 44,115) of rates charged for gas. Decision of Massachusetts Board of Gas and Electric Light Commissioners reducing rates, Dec. 31, 1912.

This decision is the result of a long and hard fought battle over the rates of this company. The case was complicated by the City Council's having, in 1910, at a time when the Board's order reducing the price of gas to 80 cents per thousand was being contested by the company in the federal courts, granted a "franchise and consent" permitting prices to be charged higher than the Board's order. The company claims estoppel of the complaint by the 1911 Council, on this ground, on which point the Board holds:

81—**Municipal Regulation.**

> Had the council possessed in 1910, the authority to prescribe the prices to be thereafter charged . . . the Board is of the opinion that nothing has since happened which would prevent the council of 1911 from being now estopped from prosecuting this complaint.

But the serious difficulty is, that the council did not have express authority to fix the price of gas in Haverhill. No action by local officials can, in any way, restrict or qualify the authority expressly vested in this Board by the Legislature, to interfere to reduce a price. The council's action with respect thereto, was at best, but the expression of the opinion of its members, entitled to weight because of their official position, but controlling only to the extent to which they in fact represented the sentiments of the inhabitants of the city, and not necessarily conclusive. It is for this reason that the Board believes that, notwithstanding the action of the municipal council of 1910, the council of 1911 is not legally estopped from prosecuting this complaint. . . .

The controlling considerations which determined the rates ordered, are shown in the following extracts:

33—**Capitalization.**

In some cases, and under some conditions, the market value of a company's stock may offer some indication of the actual value of its property. In this instance, however, the capital stock of the company has been withdrawn from the market ever since it became, in 1899, the property of the Haverhill Gas Securities Company, and was pledged as security for that company's bonds. The present owners, in order to acquire this stock, which constituted the entire assets of the Securities Company, expended in 1909, as the evidence showed, for all the stock and bonds of the latter company, $602,523. There is no other indication of the market value of the Gas Light Company's stock. . . .

311—**Basis of Valuation.**

Much of the time of the hearings was taken up in an attempt by each side to determine the present value of the company's property. Two witnesses for the company submitted valuations based, with the exception of the two tracts of land containing the generating and storage plant, which were taken as valued by the city assessors, upon their judgment of the present market value of the land and buildings, and the cost to reproduce new, item by item, all the buildings and other structures, machinery and apparatus, mains, meters and services . . . with a deduction from such cost of the estimated depreciation which each item had suffered. . . . These valuations . . . included varying sums for engineering, interest during construction, contingencies and omissions. . . .

329—**Appreciation.**

All of these valuations employed figures for land, and for some other items, which the records show to be much in excess of their original cost. . . .

315—**Intangibles.**

It is also true that the company's property seems to have been developed without distinct expenditure for engineering and kindred items, or, if any sums have been so paid, they have been reckoned as a part of the cost of gas, and been provided out of income. To each of the totals named above were added $50,000 for working capital, and to the second, $29,613 more was added for supplies and materials. . . .

31—**Valuation.**

The valuation submitted in behalf of the city . . . in which is included an item of $26,306 for engineering, interest, etc. . . . was based on what a purchaser, wishing to do the business and having the right to do it without competition, would pay for the property rather than build a new plant. In consequence, certain items in the company's schedule of its property, do not appear in the city's valuation at all. The land valuation is not of the land actually owned and occupied by the company, but the probable cost of land suitable in size and location for a gas works, but away from the heart of the city. The valuation is also made as of June 30, 1911, when the reconstruction and extension of the plant had been substantially completed. To this valuation was added the sum of $20,000 for working capital, but a deduction of $36,172 was also made from the figures otherwise arrived at, because of the claim that the company's generators and holders exceed present needs. . . .

The valuation made for the city, seems to have been affected by an opinion that the works are poorly located, for that development which the future may require, and to allow less than the otherwise fair value of the present generating plant, because it is too large for the present needs. The reasons given, however, for continuing to use the present site show clearly that no change of location can advisedly be made until long after the time to which rates now made will apply. The Board cannot, in the general interest to consumers, discourage the reasonably liberal provision for the future which this company seems to have made, neither can it concede the company's claim that franchise or going-concern value should form a part of that property on which a reasonable return should be based.

In this connection it may be noted that the present owners had no detailed appraisal made of this property before they purchased the stock and bonds of the Securities Company. They are a firm whose wide and varied experience in the purchase, construction, management and sale of similar properties is well known. One of its members testified that it was not the practice of the firm to make detailed appraisals before purchasing such properties, or the securities representing them, and that, in forming their judgment of what they were willing to pay therefor, certain general factors, such as the output, earnings, territory supplied, experience of company, what might be done in developing the property, etc., were employed, and seemed to him more reliable than a detailed appraisal, although in this State probably, a purchaser would also have to consider how large a rate of return he would be allowed to earn and pay on his investment.

51—Cost of Service.

The company's returns exhibit its annual operating expenses in detail, as required. It was contended in behalf of the complainants, that the operating expenses, as shown prior to the advent of the present owners, and the reconstruction and extension of the plant, are of little value in determining what may be reasonably expected in the future. This was especially urged as to the cost of manufacture, because of the increased economy and efficiency to be secured by the changes in method, and in the works equipment. The city's witness testified in detail as to what, in his judgment, would be the reasonable expense of operating the plant, exclusive of repairs, renewals, maintenance and depreciation. In this estimate he omitted any allowance for maintaining gas arcs on the premises of private consumers, and naphtha lamps on the streets, on the ground that these matters were not a part of the company's public duty, and should not be considered in determining the cost of the gas supplied to its customers generally. For similar reasons he allowed but one-half cent per thousand cubic feet sold, for the cost of selling and caring for gas stoves. He also omitted any allowance . . . for bad debts, because this item he believed to be properly a deduction from income, and in any event to be in practice more than offset by the loss [by customers] of prompt payment discounts. In his judgment, the company's actual cost for management and office expense, was too high. His total computation of the reasonable cost at the customer's burner, exclusive of repairs, renewals, maintenance and depreciation, was 46 cents a thousand. To this he added 11 cents to cover the items excluded. Of this 11 cents he testified that 3 cents should cover ordinary repairs and renewals, as distinct from maintenance and depreciation. . . .

32—**Depreciation.**

Assuming the property provided by the stockholders has been kept in good condition, any future depreciation allowance is the measure of those demands which intelligent management, and a wise foresight, find necessary for maintaining that property at its normal efficiency. Anything less than this will tend to injure the stockholders; anything more may unjustly burden consumers. . . .

All parts of a plant, excepting land, suffer constant depreciation, though it may be imperceptible to the untrained observer. Provision for depreciation is only designed to keep a plant good. It is as necessary a part of the cost of carrying on the business as the expense for coal or wages. Although it was this item upon which the parties were most nearly in accord, the Board hesitates to fully accept their view. In view of the constantly changing ratio of output to plant value, it is difficult to adopt any rule which fixes a certain definite amount per thousand feet, for a proper depreciation charge, which may be applied to all companies, or to the same company at all times. Moreover, the amount of this charge may be materially affected by the degree of liberality with which repair accounts are treated. . . .

Under all the circumstances the Board believes that the company can well afford to qualify the emphasis placed upon this item, until at least it has begun to more positively reap the benefit of its recent reconstruction expenditures and other activities, and its output is closer to the present capacity of the plant. . . .

34—**Rate of Return.**

The company contended that a fair price should cover its operating expenses, an allowance for depreciation, and a fair return upon the value of its property at the time the controversy arose, including its franchise and privileges; that such value may be proved by actual cost, and reproduction cost, of its property, and amount and market value of its stock and bonds; and that the fixing of a price which will not afford a fair return upon such value amounts virtually to a taking from its owners. Taking its actual cost of 62 cents, allowing 8 cents for depreciation and a return of 22 cents, or 6 per cent, on $900,000, for the value of its property, and annual sales of 250,000,000 feet, the company claimed that a fair present price would be 92 cents, and that the reduction which might come with an increased output was already anticipated in the price of 85 cents which it had already offered.

The city urged that the fair price depends upon (1) the cost at the burner (including a proper allowance for repairs, renewals and depreciation), and (2) a capital charge based upon the capital

stock duly issued, and not necessarily upon the value of the property owned by the company. Using its figures of cost already stated, and allowing 3½ cents a thousand, or a return of 10 per cent. upon the capital stock outstanding, it suggested that 60 cents was a fair and liberal price. . . .

It will be noted that the city's claim makes no provision for a return upon the debt incurred for the admittedly necessary reconstruction and extension of plant by the present owners. A fair allowance for this, however, fails to reconcile the difference between the parties. This difference seems to rest primarily on a radically different conception of the law applicable to a case where there is such an exaggerated disparity of capital stock to assets, and in which these assets have been accumulated in such large measure from earnings. Based only upon the existence of the unusual surplus, and the comparison of its former prices with those now prevailing, the city alleged that the company for many years charged excessive prices, and that this extortion should not go unpunished. The company denied that its prices had been excessive, and claimed that its surplus was built up because the company refrained for many years from dividing all the earnings which might have been legally and properly declared in dividends.

(Note—This case is a very interesting example of the attitude taken by a city in attempting to force a rate reduction, as here the value of the property of the company exceeds many times the amount of capital stock issued. The shifting of the position taken by the city in this case, from that usually considered logical by the commissions and the courts, is noteworthy.)

2—**Public Service Regulation.**

It is perhaps idle now to speculate upon the motives of the original owners. So far as their acts may be material it seems probable that they paid in dividends all that they deemed it expedient to distribute, and that they maintained as high prices as their business prudence, tempered by public opinion, and prices charged elsewhere, dictated, with but a dim perception of the obligations resting upon them as purveyors of a public service. **But in fixing a price for the future, the Board cannot undertake to reconstruct the past according to some theory, which might have maintained a more equitable relation between the company and its consumers.** . . .

34—**Rate of Return.**

The Board is not, in its judgment, in the consideration of a proper return, required to exclude any property of the company necessary for the welfare of the public and actually used therefor, although it may have been provided by the investment therein of surplus earnings accumulated in past years. . . .

69—Rate Schedules.

The Board recommends that on and after the first day of February next the net price for gas sold by the Haverhill Gas Light Company shall not exceed 80 cents a thousand cubic feet.

The Company has again taken the matter to the courts, setting forth that the conditions of manufacturing require a price of at least 95 cents per thousand, and asking for an injunction against enforcing the order.

REFERENCES

RATES

453—Load Factor.

Connected-Load Investigations, editorial, Electrical Review, Feb. 15, 1913, p. 335.

States that studies of the connected load from time to time, are among the most useful methods of analyzing central station business operations. Classifying the known loads wired into the distributing circuits, and approximating their performance and earnings, go a long way toward indicating the sort of business which is most profitable to develop in relation to the companies' resources, and show how to extend that branch of its supply which calls for the least additional investment in plant, and which can be delivered at the lowest additional operating cost per unit.

The equalization of outputs, popularly known as the flattening of the load curve, is the greatest source of benefit to the business. If there is a bad slump in the output curve during the noon hour, the efforts of the staff will be found bearing upon restaurants, hotels and clubs to adopt electric cooking, dumb-waiter and special lighting service during this time of their business peaks; if the power load overtops the lighting demand the greater part of the year, special attention will be devoted to the addition of residence and commercial lighting loads; and if the productive machinery stands idle during certain early morning hours when industrial electric heating would be worth while, the discerning inquirer will not wonder why a campaign is afoot to secure such business. And last but not least, if the station runs at about 10 or 15 per cent of its average output during the hours from midnight to 7 a. m., the reason for its advocacy of the electric-truck charging load in its territory, accompanied with the expenditure of plentiful good dollars in local electric-vehicle engineering and advertising, will not be elusive.

51—Cost of Service.

Operative Cost of Electric Wagons in Service of Commonwealth Edison Company. Electrical Review, Feb. 15, 1913, p. 346.

This gives in a table, a statement of the total costs of electric wagons used by Commonwealth Edison Company, Chicago, for the three years, 1909, '10, '11, these vehicles having increased in number from 1 in January, 1909, to 43, at the end of December, 1911. Nineteen are equipped with Edison batteries, the others with lead batteries. The report is given on 30 wagons and every item of expense has been recorded, including energy at 4 cents per kilowatt-hour, and the results show a grand total of all general expenses, operating costs and fixed charges of 25.2 cents per mile. The operations of 1912 are now being tabulated by the Commonwealth Edison, and indicate reduced costs.

62—Character of Service.

Electricity in Cotton-Seed-Oil Mills, illustrated article, Electrical Review, 5¼ pages, Feb. 15, 1913, p. 339.

Gives tables of data from cotton seed oil mills in North and South Carolina, full descriptions of the installations, and all the needed equipment, and advantages of motor drive over steam engines.

62—Character of Service.

Costs of Pumping Water at Isleton, by A. F. Bridge and Ralph Reynolds, illustrated article, Journal of Electricity, Power and Gas, 6 pages, Feb. 25, 1913, p. 131.

Gives data from operations of installations for pumping, in the work of irrigation and reclamation of land, by the Great Western Power Company, with a network of transmission lines, over a great region at the lower end of the Sacramento-San Joaquin rivers deltas, California, claimed to be the richest land in the world, with a double circuit 100,000 volt system. Information of load factor, and other features of operation are given, with tables and curves of costs. Power rates range from 3 cents per kilowatt hour, for less than 31 kilowatt hours per month, to 1 cent per kilowatt hour, for 540 kilowatt hours per month, with a minimum charge of $6 per horse power per year.

62—Character of Service.

Readiness to Serve Methods. Reclaimed Lands, by Ross B. Mateer, Journal of Electricity, Power and Gas, 2 pages, Feb. 8, 1913, p. 141.

Describes the process of reclaiming land, by means of dykes, and electrically operated pumps, which has produced much of the soil now commanding high prices in the Sacramento valley. A table of irrigation data gives the size of motor used per acres irrigated, and results in irrigation direct from pumps, and from reservoirs, operating costs are compared with those of steam equipment, showing a saving of from $9 to $12 per year per horse power, by electrically operated pumps over steam operation.

GENERAL

313—Prices.

Prices of Engineering Materials, Price Changes and the Business Outlook, Engineering News, 5 pages, Feb. 6, 1913, p. 35.

83—Municipal Regulation.

Home Rule of Public Utilities Recommended in Seattle, Electric Railway Journal, Feb. 1, 1913, p. 225.

The general ordinances of the City Council of the city of Seattle, Washington, having met with continued reverses during the past year, the city superintendent of public utilities recommends to the Mayor, that the power of control be taken from the Public Service Commission, and urges that representatives be sent to Olympia at the next session of the State Legislature, to secure such action.

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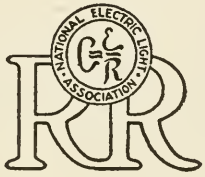
RATE RESEARCH



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Rate Research

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For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

623—**Large Power Rates.**

CONTRACT BETWEEN GREAT FALLS POWER COMPANY AND PUGET SOUND RAILWAY, Electric World, Feb. 8, 1913, p. 284.

The plans for the electrification of the Chicago, Milwaukee and Puget Sound Railway, from Harlowton, Mont., to Avery, Idaho, a distance of 440 miles, include the supply of wholesale power from the Great Falls Power Company, Great Falls, Mont., with plants at Rainbow Falls, and Black Eagle Falls, in Missouri River.

The Railway Company agrees to electrify its line between Harlowton and Deer Lodge, Mont., a distance of 238 miles, before January 1, 1918, and also agrees to buy from the power company electric energy at the rate of 10,000 kilowatts, maximum demand, for the full period of the ninety-nine-year agreement, but two years' notice will be given the power company that delivery must commence. The railway company has several options for more power, up to a total rate of 25,000 kilowatts, maximum demand, the agreement as to this additional demand being as follows: Not less than 4,000 kilowatts, nor more than 8,000 kilowatts, if called for prior to January 1, 1923; not less than 3,500 kilowatts, nor more than 7,000 kilowatts, if called for at any time between January 1, 1918, and January 1, 1928, if at least 6,300 kilowatts additional has been called for prior to January 1, 1923. Additional energy, when once called for, as above, will be supplied for the entire remaining term of the contract.

Delivery of energy will be made to not more than five stations between Deer Lodge and Harlowton, at 50,000 volts or 100,000 volts, three-phase, 60 cycles, alternating current.

The railway substations are to contain sufficient synchronous machinery to secure a power-factor, leading or lagging, of at least 80 per cent. Twelve months' notice will be given the power company of the location of the delivery points. The power company will also have the right to install Tirrill regulators in the substations, for the operation of synchronous machinery, in such manner as to receive any power-factor between 80 per cent leading, and 80 per cent lagging.

EDITORIAL NOTE.—All indented matter is direct quotation.

The rate of energy will be 5.36 mills per kilowatt hour, subject to a minimum bill, after the first year of service, equivalent to 60 per cent of all the energy contracted for. The power company is also required to pay the federal government a tax of 5 mills per 1,000 kilowatt hours for all energy delivered over transmission lines crossing the public domain.

This region is mountainous, embracing some very heavy grades, and it is estimated that electrical operation will result in large financial saving.

COMMISSION DECISIONS—NEW YORK

132—Protection from Competition.

Application of the Red Hook Light and Power Company, for permission to construct an electric plant and a gas plant in the city of Hudson (pop. 11,417). Decision of the Public Service Commission (2nd D., N. Y.) denying the application. Nov. 14, 1912.

The Common council of Hudson granted a franchise to the Red Hook Light and Power Company, for the use of the streets for the purpose of conducting and distributing electricity and gas. The city is already served by the Albany Southern Railroad Company, and the Commission in refusing its permission for the exercise of the franchise to the new company, quotes from its own former decisions, from decisions of the Wisconsin Railroad Commission, and of the Massachusetts Gas and Electric Light Commission, all condemning competition in public utilities, concluding

> It is needless to multiply quotations upon this point. All of the language hereinbefore cited represents the well settled convictions of all those who have carefully studied the matter.
>
> This Commission sees no reason for departing from the rule it has heretofore followed, and which in its judgment experience has abundantly justified.

676—Street Lighting.

Complaint of the Village of Ossining against Northern Westchester Lighting Company (Ossining, pop. 11,480, Briarcliff Manor, 417, Pleasantville, 2,207, etc.) charging unjust and unreasonable rates for street lighting. Decision of the Public Service Commission (2nd D. N. Y.) reducing the rates. Jan. 9, 1913.

The Northern Westchester Lighting Company, which is a merger of the Briarcliff Manor Light and Power Company, the Ossining Heat, Light and Power Company, and the Northern Westchester Light and Power Company, has continued to supply the street lighting in Pleasantville at rates of $19 per year per incandescent light of 25 candle power, as prescribed by franchise granted to the predecessor company, the Briarcliff Manor Lighting and Power Company (the lights originally specified, however, having been 20 candle power), while demanding a rate of $22 for these lights, and $100 per year per 425-watt arc lights, from the village of Ossining where the company's plant, a steam power one, is located.

An additional point in this case is the adjustment of the diverse contentions of the company and the municipality, in regard to a provision of the franchise for free service to the municipality, to the amount of $2,000 per year.

The following are the essentials of the decision:

> It is set forth in the complaint that under a franchise granted by the Village of Ossining, . . . the respondent is required to furnish the Village of Ossining, free of charge, light to the amount of $2,000 per annum, and at such place or places within the limits of the village as the board of trustees may appoint. We find that the said franchise does so provide. The position of the respondent as to such annual charge against the company imposed by the franchise, is that the amount of such annual charge, $2,000, may be properly added to what would be otherwise reasonable rates for the municipal lighting in Ossining, and respondent cites the opinion of the Commission in the matter of Genesee Light and Power Company (2 P. S. C. 2nd D., 485), quoting as follows:
>
> "The underlying principle is that whatever the municipality receives from the corporation for a franchise may be added to the charge of service. If the payment is made entirely in either money or service, the corporation may recoup itself directly from its customers in that year."
>
> We held in the case cited, that an annual charge in money or service to be paid or rendered to the municipality, constitutes an operating expense, and for which the company is entitled to recoup itself in charges to its customers during each year. The clause of the franchise under consideration provides that "The company shall also, during the continuance of the franchise, supply the Village of Ossinning free of charge, with light to the amount of $2,000 per annum at such place or places within the limits of the village, as the board of trustees may appoint." If we take respondent's view, the result would be to entirely nullify this provision. Assuming that the municipal lighting for Ossin-

ning should be computed at rates conceded to be reasonable, and that the total amounted to $10,000 in a given year, it would be permissible, under respondent's contention, to so increase the rates that the total charge would be $12,000, and in that way the additional $2,000 would be returned to the company. Precisely the same result would be reached if the provision for $2,000 of free lighting had not been inserted in the franchise.

It is evident, therefore, that if the franchise provision for $2,000 of free municipal lighting is to have its intended force, such service to the amount in respondent's established rates of $2,000 must be regarded as an operating expense, to be distributed over all of respondent's business, and not be applied to a particular part of its business, such as lighting furnished to the Village of Ossinning for its public streets and buildings. Undoubtedly this annual charge of $2,000 rendered in service, has a proportionate bearing upon the street lighting rates under consideration, just as any other legitimate increase or addition to its regular operating expenses must have upon that, or any particular service rendered by the company. But this is very far from saying that the entire amount, in this case $2,000 in service, shall be added to what would be otherwise a reasonable charge for that particular service. This annual charge is to be regarded as a general addition to its operating expenses, as relating to all of its business, and is not to be segregated in its application, as respondent contends, to the lighting service which is rendered to the municipality. Taking now its effect upon the complaint, it is clear that, the reasonable street lighting charge having been determined, the intent of the franchise is that $2,000 of service at such charge shall be deducted from the street lighting bills of the village. The purpose is the same as if the franchise condition required a money payment to the village of $2,000 in return for the franchise. . . .

When all commercial lighting rates of a company in one locality are under consideration, evidence as to rates charged by other companies in other communities, can be little more than indicative of what the respondent might do if its operating conditions would permit, and its bearing would be only incidental as taken in connection with considerations really informing and controlling. When, however, a single branch of a company's business is drawn in question, such as its price for lighting the streets of a municipality, a comparison with the charges made by other companies, in various localities, has greater weight, particularly when the party offering the evidence has also brought together pertinent statistics of operation, as complainants have done in this case.

The respondent puts its cost per kilowatt hour sold at 3.872 of a cent. The exhibit put in by complainants, states the cost per kilowatt hour at 3.06 of a cent.

If we apply to this street lighting, respondent's full average cost of operating expenses per kilowatt hour, making suitable addition for lamp maintenance and allowances above such cost, for proportion of fixed charges, we are unable to estimate a price amounting to $22 per incandescent lamp or $100 per arc lamp. No figures have been presented to us furnishing the basis for definite calculations, and what is said above is based upon the general knowledge of the Commission. It is for the interest of lighting companies to furnish municipal lighting at low profit, particularly where all-night service is provided. Such service is rendered, for the most part, at a time when the company's operations are off the peak-load. Low prices also operate to induce municipalities to provide an increasing number of lights, and this increases accordingly the total profit of the company from street lighting. . . .

[The company] also furnishes one or more private consumers in Briarcliff Manor incandescent street lighting at $20 per year.

We are satisfied, as to the incandescent lighting, that the Village of Ossining is entitled to a considerably lower price for its street lighting than is accorded by respondent to the other places above mentioned as served by it, the current for which purpose is manufactured in Ossining, and transmitted by electric transmission line to such places. It is possible that some exception might be made as to comparison with the Village of Pleasantville, on account of the fact that the price per lamp has been carried over from the original franchise. But even though that condition may have consideration, it seems clear to us that the price at Ossining should not exceed the price in Pleasantville. We arrive at this conclusion not merely by the comparison of the price charged by the company in Pleasantville as compared with the price charged in Ossining, but upon conditions of cost to the company for rendering the service in Ossining, so far as we have been able to arrive at a general conclusion as to such cost, and the record generally as made in this case. We do not think that the apportionment of the annual charge due to required free lighting in Ossining, has sufficient bearing to alter this view. We are of the opinion that the price of $100 per arc lamp which the respondent is now charging in the Village of Ossining, is excessive, and should be reduced so as not to exceed $90 per such lamp. Order should be entered requiring the respondent to cease and desist from its present charges for street lighting in Ossining, and henceforth not to exceed for such street lighting $19 per 25 candlepower incandescent lamp per year, and $90 per year per arc lamp of the kind and power now in use.

This ruling applies to the future, and has no application to charges made at present or in the past.

COMMISSION DECISIONS—KANSAS

223—**Rate Regulation.**

Complaint of the Parsons Railway and Light Company, (Parsons, Kansas) pop. 12,463), against Certain Ordinances, Orders and Resolutions, Rates and Regulations attempted to be Made and Enforced by the City of Parsons. Decision of the Kansas Public Utilities Commission, increasing the rates. Nov. 1, 1912.

The ordinance of the Board of Commissioners of Parsons found by the decision to establish confiscatory rates is as follows:

> The maximum rate for electric current furnished and supplied to any persons, firm, company, association, business, institution or corporation, residing or doing business in said City of Parsons, Kansas, by the Parsons Railway and Light Company, shall be, and is hereby, fixed at not to exceed six cents per kilowatt*, for light, heat and power, or for any other purpose.for a period of five years from and after the first day of July,A.D. 1912.
>
> Notice was given as required by law, and a hearing was had at the City of Parsons on the 8th and 9th days of August, 1912, at which a large amount of evidence was heard. . . .
>
> The Commission heard all the evidence offered by either the Light Plant or the City. George C. Shaad, Professor of Electrical Engineering at the Kansas State University, and W. J. Hagenah, Public Utility Statistician of the City of Chicago, testified for the Light Plant. B. F. Eyer, Professor of Electrical Engineering of the Kansas State Agricultural College, testified for the City. Mr. C. C. Witt, and Fred H. Hanson, Engineers for the Commission, made an examination of and report concerning the property of the Light Plant.

31—**Valuation.**

> Professor George C. Shaad for the Company, and Professor B. F. Eyer for the City, each made an appraisement and valuation of the plant in controversy, and each testified concerning that valuation. In addition to these valuations C. C. Witt, the Comn ission's Engineer, also made a valuation. . . .
>
> From the evidence before the Commission it appears that the value of the electrical plant of the Parsons Railway & Light Company, for rate making purposes, may properly be fixed at $119,000, divided substantially as follows:
>
> $106,000 for the present value of the physical property, devoted to the production and distribution of electricity, for commercial and arc lighting purposes, and for use by the street railway.

*So in original—Kilowatt-hour meant.

315—**Going Value.**

The Going Concern Value of the plant may properly be fixed at $13,000.

512—**Apportionment of Expense.**

The Commission objecting to the Company's figures for operating expenses, which showed an increase of $12,422.87 over those of the previous year, cut down this item by one-half of the amount of the increase.

32—**Depreciation.**

4 per cent on the present value is allowed.

34—**Rate of Return.**

7 per cent on the present value is allowed.

69—**Rate Schedules.**

The Commission is of the opinion, and therefore finds, that a proper maximum rate for electricity, sold for lighting purposes, to residences, flats, dwelling houses and rooming houses, including incidental use of appliances on lighting circuits and passing through the same meter, will not exceed a charge of 10 cents per kilowatt-hour, for the first 20 kilowatt-hours or less used per month, 7 cents per kilowatt-hour for the next 40 kilowatt-hours and 4 cents per kilowatt-hour for all current used in excess of 60 kilowatt-hours per month; and that a proper maximum rate for electricity sold for all other lighting purposes will not exceed 10 cents per kilowatt-hour for the first 50 kilowatt-hours; 7 cents per kilowatt-hour, for the next 100 kilowatt-hours, and 4 cents per kilowatt-hour for all current used in excess of 150 kilowatt-hours.

The minimum charge for lighting should be 75 cents per month.

The schedule of rates for power for five-horsepower demand and over should be:

For from	1	to	80	hours'	use	per	month	of	demand,	6	cents	per	kilowatt-hour		
"	"	81	"	90	"	"	"	"	"	5.6	"	"	"	"	
"	"	91	"	100	"	"	"	"	"	5.27	"	"	"	"	

And so on, by proportional price reduction for increased demand up to

For from 291 to 300 hours' use per month of demand, 3.38 cents per kilowatt-hour.

The minimum charge shall be 50 cents per horsepower per month. The hours use per month of demand shall be determined in the following manner: Divide the number of kilowatt-hours used per month by .6 of the rated horsepower of the connected load.

A discount of 10 per cent shall be allowed for all payments of all bills made on or before the 10th day of the month following the month for which the bill is incurred.

NOTE: Particular attention is called to the rate of return allowed in this case. The Commission gave no reason for allowing 7% return, and upon inquiry, stated that it had nothing to add to the opinion in the case. This is the only commission decision based upon a definite valuation where less than 8% return has been allowed and it is fair to presume that the Commission named a return of 7% in this case in order not to establish a rate higher than 10c per kilowatt-hour.

Attention is called to the very peculiar rate schedule, which directly gives a lower rate to residence consumers than to all other consumers. It is understood that the Commission desired to benefit the small consumers, on the theory that they could least afford to pay a higher rate. This method of accomplishing the result, however, is an absolute departure from all the recognized theory of electric rate making.

COMMISSION DECISIONS—ST. LOUIS

31—Valuation.

VALUES IN THE CITY OF ST. LOUIS, editorial, and REPORT ON UNITED RAILWAYS OF ST. LOUIS, by JAMES E. ALLISON, Chief Engineer and Member of the St. Louis, Mo., Public Service Commission, Electric Railway Journal, 5½ pages, Feb. 8, 1913, p. 239 and p. 248.

This report on the United Railways of St. Louis gives the amounts, and discussion thereon, of the capitalization, and valuation, including appraisal of physical property, and every item of intangible value, the result being the estimate by the Commission, of the fair value of total present property as $37,638,667.75, while the company claims that fair value should be either the face value or the market value of its stocks and bonds, which reach a total of $101,380,300, an excess over the fair value of the property as fixed by the Commission of $63,741,632. The Commission claims its valuation is a liberal one, equivalent on a mileage basis to $81,645 per mile of single track. No depreciation has been deducted in this case, in conformance with Mr. Allison's views on that subject, described in his paper mentioned in 2 R. R. 155. On rate of return the report says:

> It is the opinion of the Commission that if the securities of the United Railways were issued on the basis of the amount found by its investigation to be the true capital invested in the service of the public, a return of 6% on the capital would be ample to induce investors to enter the business, and take all existing risks. As for past risks, not due to financiering methods, the Commission believes that they have been fully compensated for by past profits. If the securities of the company were issued only on the true capital, and were divided into one-half bonds and one-half stock, as is usual and permissible under the laws of the State, there is little doubt that these bonds, secured by the entire system of the United Railways property, and amounting to less than $19,000,000, would sell on a 5% basis or better. This assumption is borne out by the market price of underlying bonds now outstanding. With bonds drawing interest of only 5% on one-half the capital, the other half in stock would earn dividends of 7%, under an allowance of 6% returns upon the whole capital.

The Commission says further:

> Disregarding the burdens caused by over-capitalization, the United Railways of St. Louis, as shown by the earnings and operating expenses, is an exceptionally good property. The management is efficient, the income assured and the net earnings large.

And finally recommends that the first steps in regulation in this case, should be along the lines of securing betterment of service, and announces a forthcoming report of its exhaustive investigations on this subject.
The editorial comment states that the fairest position concerning such great differences, in the valuation of a property, by representatives of the public, and by the corporation concerned, is that so far as possible, outstanding securities should be protected, the argument for this course being not that it rewards any who are morally or legally responsible for the creation of securities that did not represent actual investment, but that it protects those in the community who, for the most part, were innocent purchasers of the same securities for cash in later years.

COMMISSION DECISIONS—OHIO

14—Relations of Corporations With Each Other.

Joint Application of the Van Wert Public Service Company, and the Delphos Electric Light and Power Company, for approval of exchange of service. Decision of the Ohio Public Service Commission, granting the application. Feb. 12, 1913.

The application is for the approval of a contract whereby each company agrees to furnish to the other, on demand as from time to time may be made, electric power not exceeding five hundred kilowatts, at the rate of 2 cents per kilowatt hour. The Commission approves the contract, stating that the public will be benefited thereby, and receive improved service which is furnished at a reasonable and just rate.

2— PUBLIC SERVICE REGULATION

General Powers of Commission, a 55 page pamphlet issued by the Department on Regulation of the National Civic Federation, is another number of its series compilation and analysis of the public utility regulation laws of the United States.

This gives, under four main headings, the legislative provisions defining and designating the general powers which have been vested in regulative commissions. The first division of the subject is

A—Extent of general authority of commission.

This covers the authority to supervise and regulate utilities, to enter upon their premises, examine their property, and hold investigations with regard to the affairs and general condition thereof; to examine under oath their officers, agents or employes, to inspect the books, records and memoranda; the authority of commission over allied businesses; the territorial jurisdiction of commission; and the authority of pre-existing boards or administrative officers conferred on commission.

B—Authority of commission to hold hearings on proposed changes of law, and make recommendations with respect thereto.

C—Authority of commission to arbitrate or mediate in controversies affecting public utilities.

D—Authority of commission to visit and confer with other regulating bodies.

The correct reference is given to locate each section of laws quoted, and the usual alphabetical list of sources at the end of the pamphlet gives the state laws, chapters and sections, covering the whole.

REFERENCES

RATES

611—Flat Rates.

Flat Rate Campaign at Fall River, Mass. Electric World, Feb. 15, 1913, p. 351.

Tells how a highly successful flat rate campaign for residence lighting business has been carried on, and by means of newspaper advertising, five solicitors, and an electric sign 32 ft. long by 10 ft. high, shown in an accompanying photograph, on the roof of a downtown building, 600 additional customers secured in the last six months. The rate offered is $1 for four 25-watt lamps per month, burning without regard to hours of use, but connected under an excess indicator, which limits the demand at any one time.

6—Rate Practice.

Milwaukee's Low Gas Rate, editorial The Gas Age, Feb. 15, 1913, p. 177.

Describes the excellent service, at the low rate of 75 cents per thousand for the first 10,000 cubic feet used per month, with proportional reductions for increasing consumption, of the Milwaukee Gas Light Company, which has followed for many years the policy of repeated rate reductions, and in the matter of betterment of service has been alert to always do a little more than is required. This has resulted in a per capita consumption in Milwaukee 40% higher than the average in cities of its size, and has made gas a very much cheaper fuel there than electricity, coal or oil; yet without any other reason than the prosperity of the company, the rates are attacked in a complaint before the Wisconsin Railroad Commission, and further reduction demanded. In this comment the question is put, from a purely business standpoint of good policy, should not a company be rewarded for efficiency? If it sells good gas at from 50 to 75 cents, gives good service, and by eliminating wastes and inefficiency, increases its profits, should it not be permitted to pay itself a higher rate of return on its investment than if the case were otherwise? This is the principle of the sliding scale system, and the present controversy shows how much better it would have been, if Milwaukee Gas Light Company were operating under the sliding scale in the present discussion. When a company can show that a 6% return on its investment is justified by the price it charges, it is ready to talk about the sliding scale. Unless the public is tied down to some such agreement as is involved in the sliding scale, no matter how low the price, they will try to get it still lower.

51—Cost of Service.

Ton-Mile Electric Delivery Costs, Electrical World, Feb. 8, 1913, p. 301.

Gives a table showing comparison of the ton-mile costs of haulage by horses, and by electric vehicles, from data of installations of three sizes in New York City, the 1500-pound delivery service being that of a large department store, the 2-ton service including general merchandise delivery, and the 5-ton, delivery of large cases of similar material, over a wide area. The figures include the stabling of the horses, and for the electries, all expenses and charges, energy at 4 cents per kilowatt-hour, chauffeur's wages at $15 per week, writing off the investment in eight years, 6% interest on investment, insurance, taxes and one renewel of battery plates and tires yearly. The results show a cost per ton-mile of the 1500-pound delivery, of $.466 for horses, and $.207 for electric trucks; of 2-ton delivery, $.26 for horses, and $.14 for electrics; of 5-ton delivery, $.15 for horses, and $.09 for electrics, all which goes to prove the superior economy of electric trucking.

51—Cost of Service.

Tests of Effiency of Motor Trucks with Trailers. Illustrated article, abstract of a report by Richard T. Dana. Engineering and Contracting $4\frac{1}{2}$ pages. Feb. 19, 1913, p. 204.

This article gives descriptions and summary of an investigation of the relative costs of operation of motor reversible dump wagons handled in trains, and team dump wagons, recently made by Mr. Dana, the director of the Construction Service Company of New York City. Curves of comparisons, and tables of costs per ton hauled, show the large savings effected by the motor truck trains over teams. All measures of efficiency are based on delivery, this being directly proportional to a combination of the average speed, and capacity, of the outfit, and the average speed depending upon the proportion of lost time, to the actual time of hauling. The motor truck for short hauls has not been found practical, and exhaustive tests have proved that it was not due to lack of economy in the operation of the truck. Therefore the lost time which affects the rate of delivery so largely, must be responsible. A high combination of speed and capacity is needed to compensate for the increased cost of the motor truck, therefore increase of capacity without a corresponding decrease in speed, is called for, and this is provided by trailers; with these specially designed, to fit all the requirements of the motor truck, including high speed, great economy in this class of hauling is attained.

51—Cost of Service.

Power Plants: Cost of producing power based on Iowa coals, with a comparison of estimated costs and costs from actual tests, digest of a Bulletin of the Iowa State College, by H. W. Wagner, Assistant Engineer in Mechanical and Electrical Engineering. Engineering and Contracting, $5\frac{1}{2}$ pages. Feb. 19, 1913. p. 213.

This gives cost data of power production by steam plants, analyzing the details to show the power costs per brake horse power hour, delivered at the belt, and per hilowatt-hour, delivered at the switchboard, under the various common conditions of operation. Tables and curves of costs are given, and full instructions for determining all the expense factors, and calculating the cost per horse-power, and per kilowatt-hour, in any given plant.

62—Character of Service.

Isolated Plant of Gasoline Engine Factory, by Harry C. Spillman, Illustrated article, Electrical World, 3½ pages. Feb. 15, 1913, p. 343.

This is a description of the isolated power plant of the Continental Motor Manufacturing Company's factory, Detroit, Mich. All the features of the installation, which is modern in every detail, are given, every time-saving and labor-saving device and method have been provided for in the equipment, and are shown in illustrations, ground plans and cross sections of the power house. Unusual architectural attractiveness, with maximum of daylight and ventilation, have also been secured. The engine, designed for 23-lb. back pressure so that the exhaust steam can be used for heating during the winter months, is rated at 600 horse power, and guaranteed to carry 50 per cent overload. The electric generator is rated at 500 kilovolt amperes, guaranteed to carry a 50 per cent continuous overload without undue heating. The average power factor is 84 per cent, and the lowest on any circuit is 73 per cent. No cost data are given.

41—Terminology.

The "Kelvin" and the Kilowatt-Hour, Electrical World, Feb. 15, 1913, p. 359.

Discusses the proposal to give the name "Kelvin" to the Kilowatt-hour in honor of Lord Kelvin, and states that all are agreed that his name is certainly entitled to a permanent place in electro-magnetic units, from the fact of this great scientist's having been one of the main founders of the centimeter-gram-second system of units, as well as their decimally related prototypes in the practical, or ohm-volt-ampere system. In 1892, an attempt was made in England to apply Lord Kelvin's name to the kilowatt-hour, but failed, and now would be even more difficult with "kilowatt-hour" so firmly rooted in American literature, commerce, usage and law, and the industry so enormously enlarged. But the objections do not end here, for while the other names ohm, volt, ampere, watt, etc., stand each for a unit in the practical system, the name "kelvin" used as proposed would stand for a decimal multiple of a unit, merely a synonym, or abbreviated alternative, for a thousand watt-hours. We should all have to learn, teach, grasp and remember the watt-hour, as part of the whole system, and then we should have to remember, by an additional mental effort that "kelvin" was the name adopted internationally for the kilowatt hour, in other words it would not fill a gap in the system, and would cause unnecessary mental effort. The suggestion is here offered that if the "kelvin" is to be used, it should be adopted for the "watt-hour", or basic industrial unit, and use the "kilo-kelvin" instead of the kilowatt-hour.

[This, however, ignores the fact that "watt" was similarly given in honor of James Watt, 1736-1819.]

PUBLIC SERVICE REGULATION

2—Public Service Regulation.

Report on Utility Regulation, by Emerson Macmillan, Chairman, Department on Regulation, National Civic Federation, The Gas Age, 1½ pages. Feb. 15, 1913, p. 186.

This important paper, which gives a most interesting sketch of the work done by the National Civic Federation's Department on Regulation, since its organization in 1911, was very briefly abstracted in 2 R. R. 322, and now appears in full as above.

2—Public Service Regulation.

Brief, by Olin, Butler and Curkeet, and S. L. Kingan, Attorneys for the Tucson Gas, Electric Light and Power Company (Tucson, pop. 13,193), in the complaint before the Arizona Corporation Commission, by the Mayor and Common Council, as to the reasonableness of gas and electric rates and service, 247 pages.

Gives the argument of the company, under three main headings, valuation, with special attention to overhead charges and going value, as the Commission's engineers, and the company are substantially agreed upon the physical valuation of the property; second, the proper allowance for depreciation reserve; and third, proper rate of return. The present case will probably take its place at a test case in Arizona, being the first one of large issues tried under Chapter 90, Laws of Arizona, 1912, creating the Corporation Commission. Counsel states that the purpose is not to defend the present schedule of rates, which was made prior to state regulation, and when the public utilities of the state were, in a large measure, powerless to install a just schedule of rates, and the Public Service Law prohibited any change in existing rates, except as made by order of the Commission. The company now looks to the Commission, as a result of the present hearing, to establish by order a schedule of rates that will be fair and just, both to the company and the consumer.

315—Intangibles.

Complaint of the City of Milwaukee Against the Milwaukee Gas Light Company, alleging excessive rates, pending before the Wisconsin Railroad Commission. Electrical Review, Feb. 15, 1913, p. 354, and Electrical World, Feb. 8, 1913, p. 289.

States that the Milwaukee Gas Light Company, in contending that 18% is a low figure for overhead charges, in a valuation to be used as a basis for rates, introduced expert testimony naming 30% as necessary to cover this item, for a company with the history of the present one. The Commission has allowed but 12% in the majority of its decisions, but has taken 15% in its appraisal of the property in the present case. The present rates of the company range from 75 cents per thousand for the first 10,000 cubic feet, to 50 cents per thousand for all gas used in excess of 100,000 cubic feet per month.

GENERAL

755—Meters.

Recent Development in Electric Meters, by H. W. Young, Southern Electrician, 2 pages, February, 1913, p. 85.

Gives a description and illustrations of single and polyphase integrating, portable watt-hour, and graphic recording meters of mercury flotation type. They are designed to cover a wide field of electrical power measurement, and their developments here given, are those of particular interest to the central station industry.

83—Municipal Ownership.

New York Legislative Committee Opposed to State Hydroelectric Scheme, Electric World, Jan. 25, 1913, p. 176, and Electrical Record, Feb. 1913, p. 62.

The New York state joint legislative committee, named to investigate water power resources, has submitted its report, declaring that it would be impossible for the state to develop a sufficient amount of hydraulic power to make any appreciable impression on the power demands of the state. It says that there is undeveloped within the state, only 1,196,800 horse power, 262,700 horse power of which is actually owned by the state, the rest being claimed by private owners. This contradicts the findings of the New York State Conservation Commission in its pamphlet mentioned in 2 R. R. 58, and disapproves the latter's plan of state wide hydroelectric development, and high tension transmission under state ownership, similar to that which now obtains in the Province of Ontario, Canada, declaring that the Canadian system, measured by economic and business standards, is not a success.

91—Promotion and Growth of the Business.

A School to Teach the Selling of Electricity, Electrical World, Feb. 15, 1913, p. 334.

A school has been established in Chicago, incorporated under the laws of Illinois, called the Chicago Central Station Institute, to teach young men students the commercial side of the electric service industry. A tuition fee of $100 for the full term of eleven months of the course of instruction is charged, but the student will give about half of his time to the practical work in soliciting business, and for this he will be paid. The Institute is supported by the Commonwealth Edison Company, the Federal Sign System (Electric), Illinois Northern Utilities Company, Middle West Utilities Company, and the Public Service Company of Northern Illinois.

The subjects of study include salesmanship, rates for lighting and motor service, electricity in residences, and theaters and on the farm, electric motors and factory lighting, signs and decorative lighting, lamps, electrical construction, electricity for stores, accounting and metering, generating and distribution, and isolated plants.

Men prominent in the business of public utilities are to be the lecturers, and H. L. Lincoln is general instructor.

92—Economy and Efficiency.

Public and Private Efficiency, editorial Electric Railway Journal, Feb. 8, 1913, p. 241.

States that the manner in which the New York Central and Pennsylvania Railroads have completed tunnels and terminals, involving problems and expenditures, as great as, if not greater than, are called for in the completion of the New York City subway system, which has been delayed for years by the municipal ownership advocates, makes an impressive argument for the superior efficiency of private enterprise; and that had any transportation company been as slow to provide for growing traffic, as the city of New York has been to extend its subway construction, it would have deserved the censure of a dissatisfied public.

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RATE RESEARCH

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Rate Research

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For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

FAMOUS RATE PAPERS—No. 2

COST OF ELECTRICITY SUPPLY

By ARTHUR WRIGHT, President Municipal Electrical Association. Read before the 1896 Convention, Borough Electrical Engineers, Brighton, England.

(NOTE.—The paragraph headings are not in the original, and the curves mentioned therein, which are sufficiently explained by the text, are necessarily omitted.)

51—Cost of Service.

No manufacturing undertaking can be considered to trade on a sound commercial basis unless it has ascertained, to some degree of accuracy, the cost of supplying the commodity it produces. That the electricity supply business at present can hardly be said to pass this criterion of commercial soundness, the author thinks will be generally admitted, when it is remembered that although electricity has been regularly supplied for over five years, from many large undertakings in quantities exceeding a million units annually, yet at the present time no very definite basis has been agreed upon, by which the cost of energy wasted in feeders, transformers, shunted meters, etc., can be estimated, or on which to arrange tariffs for such varying classes of consumers as street lamps, motors, business premises, electric tramways and other industries consuming the electric current.

615—Rate Differentials.

To illustrate this great diversity of tariffs, and presumably the uncertainty as to the true basis for costs calculations, the author points out that in many towns discounts are given in proportion to the amount of electricity consumed, thus assuming that the cost of supplying electricity depends mainly on the quantity taken; in other towns rebates are given on the basis of the time of the day during which

EDITORIAL NOTE.—All indented matter is direct quotation.

the electricity is consumed, or on the lengthened use of the lamps, or plant, consuming or producing the electricity. Again, in others, the electricity consumed in motors, is charged at a different rate to that consumer in lamps, implying thereby that it costs less in the one case than in the other. Curious instances of the uncertainty of opinion on this subject, which is of the first importance to Central Station Managers, are afforded by the varying, and often quite arbitrary, figures charged for the electricity consumed in public street lamps, and by the compiler of Electricity Works Costs, in a largely circulated technical journal who, in estimating the profit or loss made on the supply to public street lamps, has actually to assume the cost of the electricity to these is the same as the average cost of all the electricity supplied from the Central Station.

511-512—Apportionment of Investment and Expense.

A commercial undertaking supplying only one commodity such as electricity, ought surely to be able to show from its books where and how the profits or losses are made. Hitherto, however, Central Stations have had to be judged as to whether they are successful or not, solely on the net results of the year's trading, irrespective as to whether the profits or losses were made from all the consumers, or from only a portion of them, because no proper method of keeping the Profit and Loss Account has been as yet agreed on among Central Station Managers.

6—Rate Practice.

The question now naturally arises, is there not some easy and practical method for doing away with the continued guess work at the cost of supplying electricity to the varying classes of consumers, which is so often resorted to, and with the present great diversity of systems of tariff?

612—Meter Rates.

Of the many proposed methods devised for arriving at a solution of the complex problem of determining the cost of supplying electricity, the most obvious and easy, is the usual one adopted by most of us, viz.: that of dividing the total annual expenditure or the amount debited to the Revenue Account of a Central Station Undertaking, by the total number of units delivered to the consumers, and to accept this actual average cost per unit, as a sufficient guide for all purposes. Many business men, however, now recognize that this result is of no more use in deciding the question of which is the correct tariff by which to charge the various classes of consumers, than would be, to a railway manager, the knowledge of the average cost of carrying passengers on his railway per mile, should he want to know for how little he could profitably carry a certain number of excursionists on a given day.

613—Demand or Two Charge Rates.

Dr. Hopkinson, in his classical paper before the Junior Engineers, very clearly proved that the cost of supplying electricity cannot be correctly defined at so much per unit, unless the *rate* of supplying that unit be also stated, and showed that the cost depends much more on the greatest rate at which the electricity has to be supplied, than it does on the amount actually supplied. He, moreover, urged that it was both morally unjust, and commercially inexpedient, to always charge a uniform rate for a manufactured commodity which, in one case, might very obviously require ten times as much plant for manufacturing it, as it would in another owing to its having possibly to be supplied at ten times as great a rate.

5—Rate Theory and Development.

The results Dr. Hopkinson obtained from the very bold method of analysis adopted, were so novel and surprising, that perhaps this may account for so many of us still ignoring his conclusions, and partly doubting the accuracy of his method.

Recently, Mr. Edison and Mr. W. J. Greene, in America, have attacked this problem in a very practical spirit, and the last named gentleman has still further developed the theory on the subject, with the result of arriving at practically the same conclusions as Dr. Hopkinson as to the correct basis on which to frame electricity charges.

As far as the author is aware, no one has hitherto made public the results of applying the original Hopkinson method to actual accounts. He therefore proposes to describe modifications of the method, and the results of analysing by them the figures obtained from the central supply station with which he is most conversant, namely, that of the Brighton Corporation.

51—Cost of Service.

At the onset, he stipulates that the cost of supplying electricity shall be understood to be the sum of all the items necessarily debited to the undertaking's net revenue account, or that it is equal to the amount of revenue the undertaking must earn per annum for it to be considered self supporting. In the next place, it must be understood that the methods adopted are only really applicable to stations which have got into full working order, and which are not either over-capitalized, or much too large for the actual business done, but which can be extended as soon as the increase of demand will warrant same; and in such a business as that of electricity supply, it is essential for commercial reasons to assume the supply is taken by all classes of consumers for at least one year, when estimating the total cost of supplying these classes.

Total Charges

If monthly or quarterly statements be made of the total expenses and charges debited to the revenue account of a central supply station, the most careless observer cannot fail to notice how very slightly the total expenditure varies during the different months of the year, although the output or sale of units during the different months, may vary as much as threefold.

Operating Costs.

A comparison of these monthly or quarterly statements during a period when the output has considerably varied, furnishes, in the opinion of the author, the most correct and simple method for determining those portions of the total cost of supplying electricity, which vary with the number of units sold and which are conveniently called "running costs" in contra-distinction to the "standing-by costs," and the method by which the cost of supplying any class of consumers can be approximately ascertained.

512—Apportionment of Expense.

In the first place it may be observed that, as regards the above divisions of the total expenditure into the two classes of running, and standing-by costs, in actual central station practice only the following items can be properly included under the head of running costs:—coal, oil, water, and a few other engine stores, besides those repairs to the steam and electricity generating plant which are caused by the continued supply of electricity to consumers.

339—**Fixed Charges.**

Under standing-by costs, must be included all coal and oil used in getting up steam, and in keeping the machinery and mains in a position to supply electricity to the consumers at any time, also all other stores used in the station, or on the mains, all the wages debited to revenue account, as in practice these do not vary from month to month with the output of electricity, repairs to buildings, mains, meters and those repairs to plant, etc., which are due to it having to be kept in a position to supply electricity, all rates and taxes, management expenses, insurances, and all provisions for redemption of capital and interest on same, and for the creation of any reserve or depreciation fund it may be decided to form for the purpose of preventing any cessation of the supply at any future time.

512—Apportionment of Expense.

Of the above items constituting the running and standing-by costs, the only ones which are not capable of being at once debited to the proper division are the coal, stores, and repairs of plant, but the two first of these can be very fairly divided by the use of the following simple method which its accompanying formula will explain and justify.

Let T represent the total expenditure on these items during one month, or period of time, when the sale of electricity U is great, and T′ that for another period of preferably the same year when the sale U′ is much less.

Let S be the cost of the two items coal and stores, which have to be used during each of the two periods, on account of having to get ready and to stand by, and R the running cost per unit it is desired to determine.

Then by the definition, as $T = S + R \times U$,

and $T' = S + R \times U'$,

then $T - T' = R \times (U - U')$

therefore $R = \frac{T - T'}{U - U'}$ and $S = T - R \times U$ or $T' - R \times U'$

or the average cost per unit, of continuing to supply electricity during these two periods, is the difference of the total expenditures divided by the difference of the sales in the two periods.

With regard to the item of plant repairs due to continued supply, as these repairs are of an accumulative nature, it is advisable to divide the total of all items of repairs obviously due to having to continue generating electricity from the commencement of the supply, by the total number of units since supplied, the quotient will be then a fair valuation of the running cost per unit for plant repairs.

To illustrate the above method of apportioning items involved, both on account of running and standing-by, the following statement, referring to the figures of the Brighton undertaking will be of use:—

	The amount spent in coal	Engine Stores	The units sold during these months
In the three months of October, November and December, in 1895	£990	£201	366,040
In the three months of May, June and July	365	133	109,662
The difference between the figures are	£625	£ 68	256,378

Therefore, by the above rule, the running cost for coal during these six months was

$$\frac{625 \times 240}{256{,}378} = .584\text{d. per unit.}$$

$$\text{For oil and stores } \frac{68 \times 240}{256{,}378} = .063\text{d. per unit,}$$

and from the total amount spent on running cost repairs, during the four years the central station had been in full working order, the author finds the running cost repairs averaged, at the end of 1895, .063d. per unit sold. Then, as the running costs of the remaining six months of 1895 were about the same as the above values, by this method it is

possible to arrive at a very fair division into running and standing-by costs of the items on the debtor side of the Revenue Account of 1895.

Division of the Debtor side of the Brighton 1895 Revenue Account into Running and Standing-by Items.—

ITEM	Rate per Unit for running costs determined by above method	Total running costs for the 867,500 units sold	Total standing-by costs	Total amount spent on the items during 1895
	d	£	£	£
Coal	.584	2,111	485	2,596
Stores	.063	230	302	532
Repairs to plant	.063	230	147	377
Repairs to buildings			59	59
Meters			69	69
Mains			463	463
Wages			1,719	1,719
Rates and taxes			327	327
Management			1,838	1,838
Insurance			69	69
Interest and Sinking Fund			7,777	7,777
	d	£	£	£
Totals	.71	2,571	13,255	15,826

As the annual maximum load on the station is generally increasing, the mean of the two consecutive years annual maximum loads is taken to be the demand on the Station, in calculating the standing-by cost per kilowatt; this in 1895, was £17.9 per kilowatt as thus defined.

The above obtained values for the running and standing-by costs at Brighton in 1895, are closely confirmed by quite a different method to be presently described, based on the analysis of the different years' expenditure curves, into the different terms of an equation obtained empirically.

If the total monthly expenditures as above defined, from soon after the starting of the undertaking, be plotted in the form of a curve, such as the dotted one shown in Fig. 1, and the corresponding sale of units be plotted along side this, no very obvious connection between the two curves will be discernible, at all events, certainly nothing like the uniform price system of charging implies ought to exist. If, however, the maximum annual load taken off the mains be plotted on the same diagram, as shown by the crosses, with a suitable scale, and these points or crosses be connected by straight lines, a very obvious tendency becomes apparent after the first or second year, for the monthly total expenditure to follow this line joining the points representing the annual maximum loads, and the slight deviations from this line will be found to be roughly proportional to the monthly sales of electricity.

453—Load Factor.

The author, after studying this monthly expenditure curve of the Brighton Station, which he thinks may claim to be one fairly representative of economically run undertakings, feels convinced that the

chief governing factor in determining the monthly expenditure in any Central Station will probably be found to be the maximum annual load which the station has to be prepared to meet every succeeding year, and that after the first year or two, the total of the standing charges will be found, for all practical purposes, to be fairly proportionate to this maximum annual load.

339—Fixed Charges.

Mr. W. J. Greene, in the paper alluded to, has pointed out that the standing charges ought theoretically to be divided into the three following distinct classes of expenditure:

No. 1. Those due to the preliminary expenses in starting the undertaking, which may be called Basic expenses.

No. 2. Those depending on the cost of connecting the consumers, called Connection costs.

No. 3. Those proportional to the total maximum simultaneous demand of the Consumers on the mains, and conveniently called Demand costs.

512—Apportionment of Expense.

With regard to these three groups into which the standing charges may be divided, the author finds that the following is the percentage each of the three classes bore to the total annual expenditure incurred after the Brighton undertaking had been worked four complete years:

The Basic, or those due to the original unproductive outlay, incurred in starting the undertaking, constituted 6.3 per cent of the total. Connection costs, or those due to the cost of connecting consumers, 11 per cent. The Demand costs, or those due to having to be ready to supply the annual maximum load, 66.4 per cent; and the running costs, or those due to having to continue to run the machinery after it has been started, 16.3 per cent.

(This paper will be concluded in next week's Rate Research)

COMMISSION DECISIONS—NEW YORK

55—Value of Service.

Commutation-Rate Reduction in New York City, Decision of the Public Service Commission (N. Y. 2nd D.), and editorial, Electric Railway Journal, Feb. 22, 1913, p. 319.

Reductions in the fares charged to commuters between Westchester county points, and New York City, by the New York Central and Hudson River Railroad Company, and the New York, New Haven and Hartford Railroad Company, have been ordered by the Public Service Commission (N. Y. 2nd D.). The reduced rates take effect on March

1st, 1913, for a period of at least three years, and result in the re-establishment of the rates which existed on June 30, 1910, at which time general advances were made by the companies, who claimed the necessity for more revenue to meet increased expense of operation, arising from increased wages, greater cost of material, and the alleged increased cost of moving trains by electric energy.

The Commission states that from careful study of the accounts of the companies, and of all the evidence that it is satisfied

> That the revenues derived from the increased rates have not increased above those received formerly in anything like the proportion of increase of rate. . . . The operating costs have not been decreased, but the gross earnings from the commutation rates have not afforded the relief to the companies which they expected from the increase in rates. This is another proof that the effect of the increase has been to diminish travel and not to better the net financial result to the companies. We are convinced that the fares of the companies complained of tend to restrict rather than to promote travel and to such an extent as to defeat materially the purpose for which commuters' fares are primarily established.

In reference to the costs from the electrification of the roads within New York City the Commission says,

> It should not be forgotten that the increased costs claimed by the respondents arise largely from the alleged increased cost of moving trains by electric energy. The Commission feels that, assuming some such increased cost to have been shown, there should be taken into consideration in connection therewith, that the change from steam to electricity as a motive power, has made possible the utilization of the site of the Grand Central Terminal for other purposes, and to an extent that may well pay an adequate return upon the cost of the station itself. It is a serious question to be determined only by future developments whether the use of electric energy is not the only possible method of economical operation in a city like New York, and whether it will not, all things considered, justify the continuance of the former rates rather than an increase in rates.

The general principles followed in determining the rates are thus stated,

> The question really submitted to this Commission is not just how many tenths of a cent the rate can be raised or lowered for each mile of travel, but at what point it should be placed in order to enlarge the commuting business, increase the suburban population, and thereby increase the general prosperity. Of course this point must be fixed with proper reference to the fair and reasonable returns to which the corporation is entitled over and above the actual out of pocket expense involved in performing the service.

COURT DECISIONS

WISCONSIN

83—Municipal Ownership.

Suit by Neacy v. City of Milwaukee et al., to restrain them from constructing and operating a municipal electric light and power plant. Decision of Supreme Court of Wisconsin, reversing and remanding order for temporary injunction. Jan. 7, 1913. 139 Northwestern Reporter, 409.

The voters of the city of Milwaukee carried a proposition to issue $500,000 of municipal electric light bonds, and between Jan. 1, 1902, and Jan. 1, 1908, did issue $150,000 bonds, receiving that amount for them, and expended $60,000 for a site for the plant, and additional money for engineering expenses, plats and plans, and specifications for machinery. These bonds were thereafter declared void by the Supreme Court, but in May, 1911, the state legislature passed a special act legalizing the bonds, and thereafter the city built a plant, the waste steam of which was utilized to operate a refuse incinerator, installing machinery for this, expending in all some $60,000 of the electric light bond fund, this plant to be an auxiliary plant, a unit of the city's main electric plant. On application of a tax payer, a temporary injunction was granted, restraining the city from proceeding with the construction or purchase of any plant, or from disposing of any of the second issue of $100,000 bonds, issued 1910-11.

The decision in the city's appeal from the injunction order says,

> The public utility act was passed in 1907. In 1906 the defendant city issued and sold bonds for the erection and maintenance of an electric lighting plant, bought a site for that purpose, and subsequently to the issue of the 1906 bonds, and in 1910, the common council of the defendant city authorized the construction of the plant in question, and caused to be issued a second series of bonds, by authority of a vote duly taken for that purpose. Therefore, the public utility act not having passed until July, 1907, the city up to that time at least, had a right to construct a plant without first obtaining a certificate of convenience and necessity, and it appears that the city had in fact, expended upwards of $60,000 on such plant, and incurred other indebtedness in that behalf. Clearly, under the law, there was no duty resting upon the defendant city to obtain a certificate of convenience and necessity, when there was no public utility, or when an existing one was operating without an indeterminate permit. Sub-section 4 provides: "Nothing in this act shall be construed so as to prevent the granting of an indeterminate permit, or the construction of a municipal plant where the existing public utility is operating without an intederminate permit, as provided in this act." . . .
>
> The record shows that the city comes directly within the terms of

chapter 75, Laws of 1911, and, since this law gives the right to complete the plant without any mention of certificate of convenience and necessity, it must be held that the Legislature intended that none should be required.

MISSISSIPPI

141—Reorganization.

Suit by Meridian Light and Railway Company et. al., v. Catar, to enjoin enforcement of a judgment secured against the predecessor company, the Meridian Street Railway and Power Company. Decision of Supreme Court of Mississippi, affirming the judgment, Dec. 9, 1912. Suggestion of error, overruled Feb. 3, 1913. 60 Southern Reporter, 656.

This is a case which turns upon the reorganization of a run down and unprofitable street railway, the sale of all its assets and stock for $83,000 to the new company, which thereupon delivered its own stock to the amount of $125.000, and its bonds to the amount of $106,000, to pay for the property, stock and bonds of the old company.

The decision rules,

> Succeeding corporations are not infrequently held liable, where there may not be strictly a consolidation. Neither law nor equity will permit one corporation to take all the property of another, deprive it of the means of paying its debts, enable it to dissolve its corporate existence, and place itself practically beyond the reach of its creditors, without assuming its liabilities. . . .
>
> In this case the constituent companies are estopped to take advantage of their own wrongs; a consolidation without authority was accomplished, and the new company must take, with the property and franchises of the old company, the obligation to pay its debts.

KANSAS

81—Municipal Regulation.

Suit by the City of Emporia, (pop. 9,058) Kansas, v. Emporia Telephone Company, to enforce observance of an ordinance prescribing maximum rates. Decision of Kansas Supreme Court, sustaining the ordinance. Jan. 11, 1913. 129 Pacific Reporter, 187.

The present company succeeded to the property of a former company, which operated under an ordinance specifying the rates in question, and among the new conditions prescribed when the new company succeeded to the franchise, it was provided that no attempt should be made to change the rates. The company after some years of operation, sought to raise the rates, and contended that the contract for rates was absolutely void, because the council does not possess the right to prescribe rates, and this the decision declares is true, whenever the legislative body, in which the rate regulating power is vested, itself exercises that power directly, or specifically delegates it to another body, as a commission,

> It is held that the mayor and council of cities of the second class could have no authority to contract for rates for telephone service, to be furnished to the inhabitants of the city for a fixed term of years, after the state by direct legislation, or through a commission, or other lawfully delegated authority, had acted upon the subject. . . .

But the decision further holds that in the absence of, and subject to, such superior legislative action, the cities may prescribe rates, and make contracts therefor, saying

> In such a situation, it has recently been held in another jurisdiction [Manitowoc (Wisc.) v. Manitowoc & Northern Tel Co., 129 Northwestern Reporter, 925] that a contract between a city and public service corporation will be in force between the contracting parties until the state exercises its paramount power to fix rates. . . .

and quoting therefrom as follows:

> "Statutes granting to cities the right to make long time contracts binding on the public, and fixing a rate to be charged by a public service corporation, are not looked upon with favor, and will be strictly construed. It is only where the right is very clearly conferred that the state will be held to have relinquished its power to enact laws regulating tolls. . . .

The decision concludes, citing several recent cases in evidence, that as the company holds its franchise, and enjoys the use of the streets, only through the consent of the city contained in the ordinance in question, it shall remain binding, and holds,

> The company received and still retains a right of way—certainly a substantial benefit, even if there were no other—and should be held to the condition to which it agreed, until the state acts in the matter, or some right to relief is shown.

COLORADO

129—Default in Public Service—Discrimination.

Suit by Colorado Telephone Company v. Wilmore et al., to establish change of service. Decision of Supreme Court of Colorado, ordering continuance of existing, or equivalent, service. Jan. 6, 1913. 129 Pacific Reporter, 204.

The subscribers concerned in this suit have received telephone service for years through the main exchange in the city of Denver, under special contracts, which could, by their terms, be terminated by either party on thirty days' notice. The region in which they live has recently been built up, and a large number of telephone subscribers added, to take care of which service, a new exchange was established, which being outside of Denver, charged an additional toll for connection with the city. The company gave notice to the old subscribers,

that their contracts would be terminated, and that they would be connected with the new exchange.

The decision forbids such change of service, and holds

> [These subscribers] were, for all these years, recognized, and furnished service, as being in the Denver telephone zone, and according to the proof are geographically well within the limits of the local business of the [company], as carried on in and about the city of Denver. They are, therefore, because of their established and settled status in that zone, and geographically, entitled to continue to have, as in the past, telephone service upon the same terms and conditions, in all particulars, which others, like or similarly situated in that particular territory, have and receive it; no more, no less, so long as that service is fair, just and reasonable. . . .
>
> The service to [these subscribers] may not be terminated at will by the [company,] or the character or quality of it changed, so as to make such service essentially different from, inferior to, and more expensive than, that which is now being furnished to other users, like or similarly situated in the Denver zone, so long as they are ready to receive and pay for it, after the same manner, and upon the same terms and conditions, that others in that territory do. . . .

REFERENCES

RATES

453—Load Factor.

Effect of Load Factor on Cost of Electric Railway Passenger Service, by C. N. Duffy. Public Service Regulation, 1 p., February, 1913, p. 105.

This gives tables of relations of various classes of costs, and analyses of expenses, separated into two general groups, terminal costs, which correspond to demand or fixed costs, as defined and applied in determining the cost of electric service, or in formulating a schedule of electric service rates, and movement costs, which correspond to output costs. Computations show that the reasonable length of haul is dependent on load factor conditions, which must be reckoned with in determining rates and fares.

62—Character of Service.

Electricity in Iron and Steel Mills, illustrated article, Electrical Review, 8¼ pages. February 22, 1913, p. 387.

Gives descriptions and data from the application of electricity to iron and steel plants, showing the large economies over steam power obtained by such operation, and states that the first and only question regarding the majority of the applications is cheap power and, as the central stations are doing much to solve this question, it is safe to predict that motor drive will become universally adopted in steel mills, even for the more severe classes of service, such as reversing mills, etc.

One installation described gives the power consumption for the past seven months, varying from 11,400 kilowatt-hours in September, to 36,700 in July, the contract being on a demand plus a consumption charge, resulting in an average rate of $.012 per kilowatt-hour.

51—Cost of Service.

INCREASE IN FARE ORDERED BY NEW JERSEY COMMISSION, Electric Railway Journal, 1¼ pages, Feb. 22, 1913, p. 324.

The New Jersey Board of Public Utilities Commissioners, after a careful inventory and complete valuation of the property of the New Jersey and Pennsylvania Traction Company, has found that the present rates of fare on the Princeton division, extending between Trenton and Princeton, failed to accord a just and reasonable return upon the value of the property, and were lower than similar charges for comparable service elsewhere, and has ordered an increase from 10 cents to 15 cents per fare, effective Feb. 5, 1913, for one year. The low rate had been fixed by ordinances of the township and borough of Princeton, and of the city of Trenton, and as the Commission's power by statute to fix just and reasonable rates had not been interpreted as superseding an extant contract fixing rates, where such contract was operative prior to the statutory vesting of power to fix rates in the Commission, the ordinances had first to be rescinded. This was done by Princeton, which agreed to submit to the Commission the question of equitable charges. The Trenton ordinance was litigated, and by a decision of the Court of Errors and Appeals, Commission jurisdiction allowed.

The opinion says that to set reasonable and just rates of fare for passengers traveling only a part of the distance between the two termini, it was proper and necessary to divide this line into three zones instead of two, with a five cent fare for each zone. The Commission emphasized the fact that the increased fares were largely experimental. It was, however, in the interest both of the traction company and the traveling public that the advance in fare should not be so heavy as to tend to drive passengers to other avenues of travel.

62—Character of Service.

ISOLATED PLANT ECONOMY, and ELECTRICAL EQUIPMENT OF A MODERN BUILDING, editorial and illustrated article, Electrical World, 7 pages. Feb. 22, 1913, p. 383, and p. 395.

The article gives full description, with illustrations, plans and diagrams, of a new isolated plant of 500 kilowatts generating capacity, for the Aeolian Hall, New York, with details of the wiring for feeder and distribution system, and the illumination of concert hall, exhibition rooms and offices.

The editorial comment says that wide, exact and reliable information should be collected of all the costs of isolated plants, for comparison with central station service, to determine the long-debated question of relative economy, and states that we have no thoroughly up-to-date examination of the load curves of office buildings, or of the actual conditions of economy found in the plants. Such data are perhaps at hand, but have not been brought out into the light as they should be. There are available to those interested in the subject merely *ex parte* discussions by central-station men, and occasional figures of a somewhat vague character from those who are operating isolated plants. It is difficult to determine offhand where the costs of energy from a plant operated by a single non-condensing engine without a battery to help over the peak, meet those of central-station supply from a modern turbo-generator plant. Also the "Locomobile" type of generating unit, extremely well known on the Continent, and in use even in South America, but as yet little known in American practice, claims attention as equalling the record in fuel consumption of even rather large turbo-generators.

PUBLIC SERVICE REGULATION

1—Public Service.

Popular Fallacies in Public Service, by Frederick Strauss, Public Service, 3 pages, March 1913, p. 97.

This paper was presented before the midyear meeting of the American Electric Railway Association, New York, Jan. 31, 1913, and gives a general survey and discussion of various so-called special privileges, but really necessary conditions of operation, of public service business, including power of eminent domain, perpetuity of corporate life, limited liability of stock holders, and franchises; and advocates a more fearless and consistent attitude on the part of companies in the matter of valuations, and reasonable rate of return, with an explanation of the expedient of "watered stock" as a means of providing the enormous capital required for the rapid development of railroad and other vast public service undertakings, under the industrial and banking systems in this country, and the equivalent practice in England.

283—Commission Reports.

Fifth Annual Report of the Public Service Commission (N. Y. 2nd D.) for the year ending December 31, 1911.

This gives an alphabetical list of electrical and gas corporations under this Commission's jurisdiction, with dates of incorporation, reorganization, change of name, nature of service, territory served, principal office, and term of corporate existence, with tables of detailed financial information of all the companies, divided into three classes, A, with operation revenues above $25,000 per year; B, between $25,000 and $10,000, and C, under $10,000.

GENERAL

35—Revenue, Expense, Income.

New York Utilities Dividends. Public Service Regulation, 2 pages, Feb. 1913, p. 98.

This is a summary of the records for the Public Service Commission (N. Y. 2nd D.), for the year ending June 30, 1912, of the dividends paid by the electric railroad corporations of the state, giving the names of the companies and the rates of dividends declared.

755—Accuracy of Meters, Tests and Inspections.

Standards for Gas and Electric Service, by J. N. Cadby, Public Service Regulation, 4 pages, Feb. 1913, p. 94.

This paper, presented at the recent convention of the Wisconsin Electrical Association, Milwaukee, by a member of the engineering staff of the Railroad Commission of Wisconsin, is a statement covering the main points of the proposed revision of the rules governing meters and meter-testing equipment and practice of the Wisconsin Commission, referred to in 2 R. R. 256.

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Rate Research

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Rate Research

Vol. 2. CHICAGO, MARCH 12, 1913 No. 24

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

FAMOUS RATE PAPERS—No. 2

COST OF ELECTRICITY SUPPLY

By ARTHUR WRIGHT, President Municipal Electrical Association. Read before the 1896 Convention, Borough Electrical Engineers, Brighton, England. (Continued from 2 R. R. 359.)

(NOTE. The paragraph headings are not in the original, and the curves mentioned therein, which are sufficiently explained by the text, are necessarily omitted.)

Operating Expense.

The most important point to be noticed in connection with these ratios is that the very small percentage that the running costs bear to the total in such a town as Brighton, viz., only 16.3 per cent., would obviously be very much smaller if coal could be there obtained at say, 10s. per ton, the price paid for an equivalent quantity in some of the northern and midland towns, and in that case, instead of annual standing charges being about five times the running costs, as they are now at Brighton, they would probably be quite eight and a half times. Hence, there is obviously the greater necessity for a differential tariff in towns where coal is cheap than where it is dear, as at Brighton.

Consumer Expense.

In view of the great expense of connecting consumers, and of this being practically independent of their demand or consumption, Mr. Greene strongly advocates the system of making a minimum charge per annum on this account, as well as on account of their demand.

The author's experience, however, tends to prove that the sum total of the three classes of standing-by expenses follow, as a rule, the rising line connecting the annual maximum demands on the mains.

451—Demand Factor.

This near proportionality of the standing charges to the plant capacity of a fairly economically run station, may be a surprise to many who think, as the author was formerly inclined to, that the cost per kilowatt demanded on the station would diminish rapidly as the sta-

EDITORIAL NOTE.—All indented matter is direct quotation.

tion increased in size; it must be remembered, however, that the above rule does not only include the standing charges due to the central station alone, but it includes all expenses due to mains, meters, service lines, etc., and that the statement does not by any means imply that two stations can be as economically run, as one, of the same capacity as the two.

339—**Fixed Charges.**

The above tendency seems capable of explanation after the following considerations:

That although the original Basic charges become less and less in proportion to the total expenditure, as the undertaking grows larger, other charges of a similar pioneering character continue to be incurred from year to year; such for instance, as those on account of the cost of extending supply mains into new districts, running or building from time to time expensive feeders and sub-stations; increased office and engine house accommodation which are generally built many years before their full capacity is wanted, and moreover this class of expenditure is not generally all incurred simultaneously, but is spread over a great many years after the starting of the undertaking. Also, as regards the connection expense, as the business grows larger, the average individual demand of the consumers on the station tends to become smaller for the two following reasons:

No. 1.—Because the class of consumers generally requiring to be connected soon after the commencement of the undertaking are the larger business premises, shops and hotels, which do not cost for connection so much per kilowatt demanded, as do the succeeding classes, of smaller shops and private houses.

No. 2—As the number of consumers supplied increases, a greater variety of classes are included among them, and the diversity of the hours at which they use their maximum loads tends to increase, so that a smaller kilowatt capacity of the plant and mains is thus required than if only one class, such as shops, whose maximum demands would be more simultaneous, were supplied; this, and the former cause, both obviously must tend to make the connection cost per kilowatt demanded on the mains increase with the growth of the supply undertaking.

The above reasons appear to the author quite sufficient to account for the observed near proportionality of the standing charges, to the maximum load on the mains, of a station in full working order.

512—Apportionment of Expense.

The other method referred to, which can be made use of in determining what effect the varying output has, on the various items constituting the total cost of supplying electricity, especially with stations that have been running for three or four years, is that of analyzing

graphically curves of monthly total expenditure, output and maximum demand; although this is more tedious and of more theoretical than practical value, the close agreement between the Brighton actual, with the monthly costs calculated from the empirical formula thus obtained, is another proof that the cost per unit for running expenses is not now more than .8 of a penny.

The formula from which the dotted line on Fig. 2 is calculated is the one found to most nearly fit the last three years' curves, and is as follows:

Total monthly expenditure in £

$$= £190 + 1.25 \times D + \frac{\text{Units sold per month}}{300}$$

Where D is the value in kilowatts on the gradually increasing maximum load line of Fig. 1.

339—**Fixed Charges.**

From the near agreement of the two analyses of the 1895 revenue account of the Brighton undertaking, the author feels justified in assuming that the cost of continuing to run the machinery after it is once in a position to supply, has not varied much from ¾d. per unit during the last three years, and that the annual standing charges can now be taken to be about £17.9 per annual maximum kilowatt taken from the mains.

619—Rate Differentials.

The question next arises, how is each consumer's proper proportion of the annual total Standing Charges, as determined in the manner previously described, to be properly apportioned?

451—Demand Factor.

Theoretically, it might be said that the standing charges ought to be divided into amounts proportionate to the maximum demand of each consumer, at the day, and at the very time, the maximum load occurred on the mains each year. This, however, it is obviously impossible to determine in practice, and would not be moveover, necessarily equitable to the consumers who might or might not have used their maximum demands at the exact moment in question. In practice some arbitrary definitions, more or less equitable, of what constitutes a consumer's call on the plant have to be made. At Brighton, for instance, instead of taking a consumer's maximum demand to be the greatest rate of taking current during the year, it has been considered fairer to the consumer to take the mean of six winter months' readings of a maximum current indicator, which, by its very nature, takes quite ten minutes to fully register the passing current. For the purposes of calculating the cost of supplying any individual consumer, it is then assumed that the mean demand as above defined, bears to the total of all the consumers' demands, the same propor-

tion that the plant and mains necessary to supply this one consumer, bears to the total plant, etc., required for all the consumers, therefore a proportion of the total annual standing charges are debited to each consumer in proportion to his mean demand.

452—Diversity Factor.

In the opinion of the author, this method gives as nearly as possible, the fairest division of the standing charges, and it makes substantial allowance for the fact, that the demands of the different consumers do not all coincide in point of time of day. Opportunities are also given for preventing any unusual maximum demand being registered, so as not to penalize the consumers for having parties, etc.

Owing to the varying time of day at which the different consumers' heaviest loads are taken from the mains among the fairly large and representative number of consumers at Brighton, the maximum load of the station is now only 66 per cent of the sum total of the consumers' maximum demands. This want of coincidence in point of time of the consumers' maxima thus means a considerable saving in plant and mains, consequently in the standing charges of the undertaking: therefore the consumers are entitled to the benefit of this, which they get by the Corporation assuming that each kilowatt demanded by a consumer only costs 66 per cent of the above mentioned £17.9 a year, or £11.8 per annum, which works out to nearly 7¾d. per day per kilowatt demanded by any consumer. This figure of 7¾d. per kilowatt, and the previously determined figure of .71d. per unit for running expenses, enables the cost of supplying electricity to any consumer in Brighton this year to be very closely ascertained, and from this data the curve of costs, Fig. 3, has been drawn.

451—Demand Factor.

The solid line gives the average cost of supplying each unit to a consumer at Brighton in 1895, who used his demand so many hours or fractions of an hour per day on the average throughout the year. The hyperbolic line of dashes shows how rapidly the charge to cover the standing costs falls as the time of daily use of the demand is lengthened; the total cost curve is obviously obtained from this by adding .71 to it vertically.

619—Rate Differentials.

As it was thought impolitic to charge consumers on the true theoretical method of so much per maximum kilowatt demanded, and so much for the running costs of the units registered by their meters, on the ground that this tariff might possibly have the effect of preventing consumers installing any other lamps than those likely to be constantly used, it was suggested that nearly as fair a charge could be made, by refusing to reduce the highest permissible price per unit consumed, until the individual consumer had paid off all his pro-

portion of the year's standing charges, as determined by the demand indicator, in the manner above described. This system has worked out very well during the last three and a half years, and naturally tends to encourage profitable consumers to use electricity.

623—Large Light and Power.

From the above calculations it follows, provided all consumers paid 8½d. per unit for the first 365 hours in the year they used their demand, and ¾d. for all units consumed afterwards in that year, the whole of the annual expenditure would be covered, and the Brighton undertaking would be considered in a self supporting condition. However, there will always be a considerable number of consumers who do not use their demand on the average one hour per day throughout the year, among whom of course must be included a great many of those connected during the year in question, and also as the maximum price chargeable at Brighton is fixed at 7d. per unit, it is impossible to charge on this equitable basis. The tariffs adopted for the last three years have been something therefore less fair to the long hour profitable consumer, and by the one now in force each consumer pays 7d. per unit for the first 365 hours in each year he uses his demand and 3d. afterwards. This tariff will doubtless produce sufficient profit during this present year from the units charged at 3d. to people using their demand, say slightly more than 1½ hours per day to justify a reduction in the 3d. units being very soon made to 2d. per unit.

451—Load Factor.

The small dotted curves show the average price paid by the Brighton consumers on the present, and proposed future tariffs, according to the average daily number of hours they individually use their demands.

51—Cost of Service.

From an inspection of the tariff and cost curves in Fig. 3, it will be seen that loss was incurred on supplying all consumers at Brighton during 1895 who used their demands less than 600 hours per annum. In connection with these unprofitable consumers, it may be quite reasonably asked how with a given plant and set of mains it can be said that the undertaking can lose money by having to supply one set of short time consumers, while it is making a profit on supplying others with the same commodity, or why selling units at 7d. can be less profitable than not selling them at all. The answer is, that in growing stations, as the author premises should alone be considered, the same expensive extensions and the consequent increase of standing costs are necessitated by having to supply the short time consumers as if they were long hour users, although they probably only use their proportion of the plant say three months out of the twelve; thus they not only cause fresh capital to be spent, the interest, etc.,

on which they cannot pay off themselves, but they necessitate their unpaid share of the standing charges being paid by the better class of consumers, who could have been supplied from the station in the condition it was in at the end of the year without further extensions having to be made for many years to come; therefore, actually this short time class increase the charges to the profitable, and this is surely only another way of stating that there is loss incurred by having to supply them.

35—Revenue, Expense, Income.

Given the cost of the standing charges per kilowatt demanded by the consumers, the running costs per unit, and the individual demands of all the consumers, it must be obvious that it is then possible to make out an annual Profit and Loss Account showing what profit or loss is made from any class of consumers. The author has prepared such a one for the Brighton undertaking in 1895. He has taken the running costs at .8d. per unit, and has divided the classes of consumers into the four following:

Consumer Costs.

1. Those who were connected during the year, and of which a great many therefore could not naturally have had enough time to pay off their proportion of the standing charges incurred during the year in providing sufficient additional plant for their probable demands.

2. The consumers who did not consume sufficient electricity to be equivalent to the use of their demand 365 hours, or one hour per day, on the average.

3. Those who were a source of loss to the undertaking owing to their using their demand less than 1½ hours per day, which was about the minimum time necessary on the present tariff to pay off all the cost of supplying them for that period.

4. The profitable class who used their demand more than about 1½ hours per day on the average throughout the year.

Profit and Loss Statement, 1895.

Class 1—Consumers connected during 1895.

Class 2—Consumers using demand less than 1 hour per day on the average throughout the year.

Class 3—Consumers using demand from 1 to 1½ hours per day on the average throughout the year.

Class 4—Consumers using demand over 1½ hours per day on the average throughout the year.

Class.	Total of the demand in kilowatts of each class	7d. UNITS						3d. UNITS.				Net Result of supply to each Class.	
		No. of units charged at 7d.	Standing charges based on 7¼d per day per kilowatt	Running Costs based on .8d. per unit.	Total Costs.	Revenue.	Loss.	No. of Units charged at 3d.	Running costs at .8d. per unit.	Revenue.	Profit.	Loss	Profit.
			£	£	£	£	£		£	£	£	£	£
1	175	32,608	2,080	110	2,190	951	1,239	25,682	86	321	235	1,004	.....
2	162	39,006	1,929	130	2,059	1,138	921	.....	.....	.....	.....	921	.....
3	118	45,564	1,410	149	1,559	1,329	230	10,873	45	136	91	139	.....
4	635	254,443	7,540	831	8,371	7,422	949	459,318	1,490	5,741	4,251	.....	3,302
Totals.	1090	371,621	12,959	1,220	14,179	10,840	3,339	495,873	1,621	6,198	4,577	2,064	3,302
											Deduct losses.....		2,064
											Resultant Annual Net Profit.....		£1,238

619—Rate Differentials.

From the foregoing profit and loss account it will be seen that in consequence of the highest price allowable being fixed at Brighton at 7d. per unit, it was necessary to charge the longer users of electricity at a substantial profit, to recoup the losses incurred in having to supply the unprofitable, although this was nothing approaching the rate of profit that would have been charged to them had all consumers paid the uniform price per unit necessary to produce the same revenue.

6—Rate Practice.

The results of the above presumably correct methods of analysis being applied to existing electricity works accounts, appear to so thoroughly confirm Dr. Hopkinson's startling conclusions, and to warrant so many fresh departures from the usual methods of attempting to develop the business of Electricity Supply, that the author sincerely trusts the convention will carefully criticise the principles enunciated, and either frankly combat, refute, or accept the following far-reaching conclusions the author has been forced to realize.

51—Cost of Service.

1. It is the duty of municipalities to charge a uniform *rate of profit* on the cost of supplying electricity, rather than a uniform price to all consumers, and much more so in the case of electricity than with gas, because of the much greater percentage standing charges bear to the total cost in the former than in the latter case.

2. To charge the same amount for the electricity consumed by 100 lamps burning 4 hours a day as that by 400 lamps burning one hour per day, is manifestly unjust to the longer user, as only a quarter of the plant and copper are required to produce and supply it, as are required by the shorter user.

619—Rate Differentials.

3. The practice of charging profitable and unprofitable consumers the same price per unit must necessarily have the effect of keeping

the average cost and price higher, consequently the supply business smaller, than by charging a uniform *rate of profit* to all consumers, because, having to charge the profitable consumer in order to recoup the loss incurred in supplying the unprofitable, must tend to prevent the former using it as liberally as if he had not to pay such a high rate of profit. Therefore electricity can be produced at a lower price on an equitable sliding scale of charges, than on a uniform price.

623—Large Light and Power Rates.

4. The extremely low price at which electricity can be profitably supplied to consumers after they have paid off their proportion of the standing charges, much more than compensates for the difficulty of understanding a uniform *rate of profit* tariff, as shown by the increasing rate of receiving applications for electricity in towns where differential charges and low prices to long users are in vogue.

5. It is in every sense advisable to retain the initial charge per unit at the highest permissible figure, and the charge for current after the standing charges are paid for, at as low a figure as is compatible with making a safe annual net profit; as experience proves that consumers judge their electricity accounts solely on the total amount, and those consumers who are always charged the highest price are naturally the least worth having, and the only ones likely to complain of the equal profit system of tariff.

6. It is erroneous to suppose that by increasing the size of the business the loss on supplying the ordinary short hour user will diminish as time goes on; as offices and similar short-time consumers generally light up at dusk, an increased number of such can only aggravate the peakiness of the load curve, and cannot therefore reduce the standing charges per kilowatt demanded, on which the cost of supplying them mostly depends.

619—Rate Differentials.

7. It is much fairer to the ratepayers to try to limit the supply to consumers who are willing to pay their share of the costs, than to have to rapidly extend the supply works in order to take on more unprofitable as well as profitable consumers, or, in other words, it is more justifiable for a municipality to lose the unprofitable consumers by raising the initial price, and to take in their place more profitable ones, than to extend the works directly their capacity is reached.

339—Fixed Charges versus Operating Costs.

8. The enormous cost of getting ready to supply electricity, compared to the cost of continuing to supply when ready, can be best realized by remembering that it costs two and a half times as much to supply a unit to a consumer who uses his lights on the average only one hour per day as it does to another who uses them three hours.

92—**Economy and Efficiency.**

9. With coal at the price paid at Brighton, the same reduction can be made in the average cost of producing electricity, by so arranging the tariff as to improve the load factor 3 per cent, as if the coal bill had been reduced 15 per cent. Although the author does not wish it to be understood that he discourages the attempt to save coal, he desires to point out that it is much more worth while trying to improve the load factor than to reduce the coal bill. Since the differential tariff has been adopted at Brighton, the load factor has improved 50 per cent, showing the improvement wanted is not difficult to attain. In the Midlands, where coal is half the price paid at Brighton, probably the same reduction in the average total cost of electricity would be made by improving the load factor 3 per cent, as if the coal bill had been reduced 30 per cent.

453—**Load Factor.**

10. The differences in the financial results of central supply stations are more due to the different load factors, and the varying economy in standing-by costs, than by any great differences in the amount of running costs.

11. The rapid fall in the cost of supplying electricity as the average time of use increases makes the small householder a much more profitable class to supply, both in his residential and shopping districts, than the residences and shops where the wealthy dwell and deal, owing to the frequent absence from home of this class, and the early closing of their shops.

619—**Rate Differentials.**

12. One of the most important consequences of the fact that electricity can be profitably supplied from central stations to consumers at the rate of 8½d. per unit for the first 365 hours in each year they use their demand, and for something between ½d. and 1d. (according to the price of coal) for any electricity consumed afterwards in the same year, is that street lighting and that of basements or dark buildings lighted all day long, can be more cheaply done by electricity than by any other form of artificial light, as in these cases, where the use is on the average eleven hours per day, or 4,000 hours per annum, the inclusive cost for the electricity consumed will not generally exceed 1½d. per unit.

The fact that up to the present only the very fringe of street lighting has been touched by the Electricity Supply undertakings appears to the author a sure sign that Dr. Hopkinson's conclusions have been hitherto ignored by most of the responsible Managers, and to again direct and urge them to give their closest attention to them has been the author's object in writing this lengthy paper.

COURT DECISIONS

OREGON

619—Rate Differentials—Minimum Charge.

Suit by Portland Railway, Light and Power Company v. City of Portland et al., to restrain the enforcement of a city ordinance, reducing minimum charge by gas and electric light companies from $1 to 50 cents per month. On application by the company for preliminary injunction. Decision of the United States Court, District of Oregon, denying the application. Nov. 25, 1912. 200 Federal Reporter, 890.

The decision says,

> The complainant is an Oregon corporation, and defendant a municipal corporation of the state. There is no diversity of citizenship; therefore the court has not jurisdiction on that ground. Its jurisdiction is sought to be invoked solely because the ordinance of the defendant city, fixing the minimum charge, which may be collected from consumers by persons, firms, or corporations furnishing gas or electricity, at 50 cents a month, deprives the complainant of its property without due process of law, in violation of the fourteenth amendment to the federal Constitution, and impairs the obligations of unexpired contracts, existing at the time of its adoption between it and its customers. . . .
>
> If [the city] had authority to pass such an ordinance, the rate fixed by it is presumed to be fair and just. The burden is on the complainant to show by appropriate allegations, and, if necessary, by proof, that the rate so fixed, if enforced, will be confiscatory. A complainant, seeking to enjoin rates fixed by public authority, on the ground that they are violative of the federal Constitution, must state facts, and not conclusions—facts which, if true, show that such rates will deprive it of a fair and just return upon the value of its property devoted to a particular public use. Mere general allegations are not sufficient. . . .
>
> There are no facts stated in the complaint showing that the rate complained of is confiscatory, or that, if enforced, it will deprive the complainant of its property without just compensation, nor is there even a general allegation to that effect. The averments are, in substance, that the cost to complainant of maintaining generating capacity for, and service connections with, each consumer exceeds the sum of 50 cents per month, and that a reasonable charge therefor is $1 per month. . . .
>
> But the court has no authority to fix rates, nor should it attempt to assume such a power, and set aside rates fixed by a legislative body, because it might, upon investigation, come to a different con-

clusion as to the reasonableness thereof. In a case of this character, the court can review the action of the rate-making body only so far as to determine whether or not, under the rate prescribed, and the other rates which the complainant may lawfully charge, it will be unable to realize a fair and just return on the value of its property devoted to the particular public use, and will amount to a taking of its property without just compensation. . . .

The averment in the bill that the rate as fixed by the city, will conflict with unexpired contracts between the complainant and its customers, outstanding at the time the ordinance was adopted, states no cause of suit in this court. The complainant could not take away the power of the city to fix rates (if it had that power) by making such contracts. Any contracts which it had outstanding, were necessarily made by it subject to whatever power the city had to modify or change the rates to be charged by it.

VERMONT

22—General Powers of Commission.

Sabre et al. v. Rutland Railroad Company et al., to compel installation of gates at a crossing. Decision of Vermont Public Service Commission, ordering the construction and operation of gates, June 1, 1912. On appeal from Commission's order. Decision of Supreme Court of Vermont, reversing and remanding the order. Jan. 21, 1913. 85 Atlantic Reporter 693.

The company attacks the Commission's order on two grounds, first, that after the hearing in the matter, the Commission employed an expert, who made investigations, and laid the result thereof before the Commission, and that no opportunity was afforded the company to examine the expert, or to present evidence in rebuttal, or to argue the case as it finally stood, and on this ground the court remands the cause.

The second contention is that all laws creating or relating to the Public Service Commission, or conferring any authority upon it, are unconstitutional, because they undertake to confer legislative, executive, and judicial functions upon the Commission, and that such functions are, by the laws referred to, hopelessly commingled, contrary to the provisions of the constitution of the state. In disposing of this, the decision gives an interesting review of regulative legislation in Vermont from 1854, when the office of Railroad Commission was first established, to the present, and a full and instructive discussion of the legal authority of the Commission.

The decision finds,

Our conclusion is that the Public Service Commission is a legally constituted body, with authority to act, and make orders with refer-

ence to the dangerous situation which, as the case now stands, appears to exist in the vicinity of the Alburgh station, and the cause is remanded to the Public Service Commission, for further proceedings upon due notice and hearing. . . .

Two judges dissent, and in a lengthy opinion written by Justice Powers it is held,

We have here, then, a court exercising practically, if not technically, the most important legislative and judicial functions in the very same matter. This certainly cannot be, unless the theory of the Constitution is to be utterly rejected. . . .

We are living in a time of great political unrest. From one direction comes the call that the government be restored to the people; from another comes the warning that constitutional government is imperiled; from all directions comes the demand, clamorous, persistent, and not always reasonable, for more and more drastic regulation of public service corporations. It is a time when legislative usurpations may be expected to be more frequent. It is a time for judges to be fearless, and courts to be firm. It is a time for that "recurrence to fundamental principles" which is "necessary to preserve the blessings of liberty, and keep government free." This court has lost an opportunity.

PUBLIC SERVICE REGULATION

299—New Public Service Law—Indiana.

The bill providing for the creation of a Public Service Commission of Indiana has been passed by the legislature, and signed by the Governor, and will become effective May 1, 1913. A statement will be made regarding this law in a later RATE RESEARCH.

2—Public Service Regulation—New York.

The Public Service Commission (N. Y. 2nd D.) has adopted a resolution approving of the construction of the plant of the Long Acre Electric Light and Power Company, and authorizing it to issue $4,000,000 in bonds and $2,000,000 in stock, the proceeds of which are to be devoted largely to the extension and improvement of the company's plant. This decision was by a divided vote, the two original members of the commission, Governor Hughes' appointees, voting against it, and the three more recently appointed members, voting in favor of it.

An abstract of the history of this case is given in 2 R. R. 260. It is expected that the New York Edison Company will again carry the matter to the courts.

REFERENCES

RATES

254—Experts.

Boston Edison Engages English Expert, Electrical World, March 1, 1913, p. 442.

Arrangements have been made by the Edison Electric Illuminating Company of Boston to retain the services of Mr. Arthur Wright, of London, to act in a general advisory capacity. Mr. Wright is best known in this country as the originator of the Wright demand indicator system, although as a matter of fact his principal activities during the past ten or twelve years have been in connection with the construction and operation of large electricity supply companies. Mr. Wright is the author of the paper on the "Cost of Electrical Supply," 2 R. R. 359.

62—Character of Service.

Electricity in Coal Mines, illustrated article, Electrical Review, 7½ pages, March 1, 1913, p. 435.

This gives tables of coal mining data, and specific information of costs of operation from installations at mines, and a careful analysis of operating conditions in the industry, showing that a saving in the cost of producing coal is effected by the use of central station power. Experience has shown so many substantial economic advantages from purchasing power, rather than building isolated plants, that central station service is now superseding the former method of supply, and the indications are that within the next five years a majority of the coal mines in this country will be operated by central-station power.

The following are the power rates charged by the Appalachian Power Company, Bluefield, West Virginia (pop. 11,188), which has recently made several typical installations.

Rate—

Demand Charge

50 cents per month per horse power of connected motor load (manufacturers rating).

Energy Charge

1.07	cents	per	kilowatt-hour	for	first		25,000	kilowatt-hours	per	month		
1.02	"	"	"	"	"	next	50,000	"	"	"	"	
.97	"	"	"	"	"	"	100,000	"	"	"	"	
.92	"	"	"	"	"	"	200,000	"	"	"	"	
.87	"	"	"	"	"	excess	over 375,000	"	"	"	"	

62—Character of Service.

Acadia Coal Company's Steam-Turbine Plant, Electrical World, 3 pages, March 1, 1913, p. 445.

This gives full description of the recently completed generating station for the mines at Stellarton, Nova Scotia, burning culm. Adjacent mines are served by underground transmission system.

INVESTMENT AND RETURN

313—Prices.

Prices of Engineering Materials, Price Changes and the Business Outlook, Engineering News, 5 pages, March 6, 1913, p. 33.

PUBLIC SERVICE REGULATION

31—Valuation.

THE RAILWAY VALUATION ACT, and A HUGE PIECE OF ENGINEERING WORK, article and editorial, Engineering News, 2½ pages, March 6, 1913, p. 476 and p. 482.

The above article gives the full text of the federal law enacted the last week in February, providing for the valuation of the railways of the United States, and of the property of every other corporation subject to the Interstate Commerce Law, as water carriers and express companies doing inter state business.

The law orders an inventory of all the property of every common carrier, and the ascertaining and reporting in detail of (1) its original cost, and all that has been expended upon it since; (2) the cost at the present time of its reproduction new; (3) the cost of its reproduction less its depreciation; it demands also that an analysis of the methods by which these several costs have been figured be furnished in each instance with the appraisals; and requires all corporations to co-operate with the Commission in the work furnishing maps, contracts, all accounts, reports of engineers, etc., which may be called for. The work of appraisal is to begin within 60 days of the passage of the act.

The editorial comment states that it is probable no law ever enacted by Congress, not even excepting the act providing for the construction of the Panama Canal, involves a larger amount of engineering work, and a larger outlay of money for engineering services than this act.

It would be difficult to exaggerate its importance, not only to the corporations affected, but to the public. The public is affected not merely because the rates to be charged by railways and other corporations under the law are in future likely to be fixed on the basis of the valuations now provided for; but because the public is first and last the owner of the railways. The stocks and bonds of railways and other corporations affected by this law are held not only by private individuals, but are held also in enormous quantities by insurance companies, savings banks, and other financial institutions holding trust funds. Every man with a savings bank deposit or life insurance policy, therefore, is vitally interested that the valuation of the railways and other corporations which Congress has ordered shall be a fair and accurate one.

GENERAL

96—Co-Operation.

PRACTICAL CO-OPERATION BETWEEN CENTRAL STATION AND ISOLATED PLANT, by PERCIVAL ROBERT MOSES, The Engineering Magazine, 10 pages, Jan., 1913, p. 578.

This article suggests a plan for exchange of service, between central stations and isolated plants, which are held out as economically indispensable because of their elimination of waste by thorough utilization of by-products, namely, exhaust steam used for heating, refrigeration, air pressure, evaporative processes, etc. Load curves are given for different classes of service, hotel, department store, office building, etc., and combination curves, showing the great excess of capacity over average and maximum requirements in a central station, and the claim is made that by co-operation on a large scale with isolated plants, the peak load could be provided for, and 50% more business could be done without additional investment. Full discussion and explanation of the plan, with much data of present day conditions and demands in large centres, are presented in developing the argument for co-operation as the inevitable future of economical electrical supply.

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RATE RESEARCH

PUBLISHED BY THE
RATE RESEARCH COMMITTEE
OF THE
NATIONAL ELECTRIC LIGHT ASSOCIATION
120 WEST ADAMS STREET - - - CHICAGO

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Rate Research

Vol. 2. CHICAGO, MARCH 19, 1913 No. 25

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATES

69—Rate Schedules.

THE DUQUESNE LIGHT COMPANY, PITTSBURGH (pop. 533,905), PENN., announces a reduction in rates by offering a new optional rate, effective April 1st, 1913, for domestic consumers, provided they made application for the change. The announcement is made in a half page newspaper advertisement, which states that this new rate is offered to popularize and extend the use of electricity, and to encourage the increased use of electric labor-saving household appliances. The company has estimated that the introduction of this reduced rate will involve a considerable decrease in its total revenue, but its experience with previous reductions of rates convinces it that the large number of new customers attracted by the lower rate and the increase in the use of electric current will, within a comparatively short time, restore the gross income to its present level, and it is hoped, eventually increase it. The old rate is 12 cents per kilowatt-hour, with a prompt payment discount of 2 cents per kilowatt-hour.

The new rate will be:

Rate—

Demand or Service Charge—

15 cents per month per active room
5 " " " " inactive room.
2 " " " " lamp socket for all sockets in excess of 50.

Each room and main hall on the first floor is rated active; rooms on second floor inactive, except bath rooms and halls which are not counted.

In apartments all rooms are rated active, except bed rooms and bath rooms rated inactive.

Minimum Demand or Service Charge—

65 cents per month.

Energy Charge—

6 cents per kilowatt-hour.

Discount—

1 cent per kilowatt-hour for payment within 10 days.

EDITORIAL NOTE.—All indented matter is direct quotation.

69—Rate Schedules.

The Aurora, Elgin and Chicago Railroad Company, Elgin Lighting Department, announces a voluntary reduction of rates for its residence service in Elgin (pop. 25,976), Ill., effective March 1, 1913. The commercial superintendent, in publishing the new rate, stated that, while it would at present decrease the company's receipts, he believed that eventually increased business would result.

The original rate is 15 cents per kilowatt-hour, with a prompt payment discount of 1½ cents per kilowatt-hour, and free carbon lamp renewals. The new rate is:

Rate—

12 cents per kilowatt-hour.

Discounts—

Prompt Payment—

2 cents per kilowatt-hour.

Quantity—

2 cents per kilowatt-hour on monthly bills of $10 or over.

Lamp Renewals—

No free lamp renewals under above rate.

COMMISSION DECISIONS

WISCONSIN

69—Rate Schedules—Wisconsin.

Complaint Against the Columbus (pop. 2,523), Wisconsin, Municipal Water Works and Electric Light Plant, that its electric rates were discriminatory and unsatisfactory. Decision of the Wisconsin Railroad Commission, adjusting rates. Electrical World, March 8, 1913, p. 490.

The Commission ordered the present schedule discontinued, and the following rates put into effect.

GENERAL LIGHTING RATE

Rate—

10c	per	kilowatt-hour	for	first			30	hrs.	use	per	mo.,	active	connected	load
8c	"	"	"	"	next		60	"	"	"	"	"	"	"
6c	"	"	"	"	excess	over	90	"	"	"	"	"	"	"

Determination of Active Connected Load—

Class A—Residences.
60% of connected load up to 500 watts
33 1/3% " " " in excess of 500 "

Class B—Stores, offices, etc.
70% of the total connected load.

Class C—Churches, industrial establishments, hotels, schools, etc.
55% of the total connected load.

Discounts—
These rates are net.

Minimum Charge—
50 cents per month.

POWER RATE

Rate—

Demand Charge—
25 cents per horsepower of nominal rated capacity of motors.

Energy Charge—
5 cents per kilowatt-hour.

STREET-LIGHTING RATE

Rate—
For series tungsten street lamps.

Demand Charge—
$3.50 per 100-watt lamp per year.

Energy Charge—
4.5 cents per kilowatt-hour.

KANSAS

Complaint of the Garden City (pop. 3,171), Kansas, Telephone, Light and Manufacturing Company v. The City of Garden City. Decision of the Kansas Public Utilities Commission adjusting rates. July 30, 1912.

The complaint is against an ordinance of the city council, peremptorily reducing the electric lighting rate, from 15 cents to 10 cents per kilowatt-hour, and the power rate to 5 cents per kilowatt-hour, with minimum charge for each service of $1 per month. The Commission made a valuation of the company's plant, by the reproduction method, deducted 12.3% of this cost of reproduction new, for depreciation, and prescribed rates which will allow a return, including $2,000 per year for depreciation, of 7.7 per cent on this value. The Commission also found that a new plant adequate for the electrical needs of the city, at present, and for several years to come, could now be built for about four-fifths of the value allowed, and concludes

> It is therefore by the Commission advised and recommended that the respondent city revise and change said ordinance so as to provide for rates as follows:

GENERAL LIGHTING RATE

Rate—

11 cents per kilowatt-hour.
Discount—Prompt Payment—
10 per cent on bills paid within 10 days.

Minimum Charge—
$1.25 per month.

POWER RATE

Rate—

6.5 cents per kilowatt-hour for first 100 kilowatt-hours per month.
5.5 " " " " " next 100 " " " "
4.5 " " " " " excess over 200 " " " "

Discount—Prompt Payment—

10 per cent on bills paid within 10 days.

Minimum Charge—

$1.25 per month.

Though the Kansas utility law excepts from the jurisdiction of the Commission, municipal plants, and also allows local regulation of utilities situated wholly or principally within any city, yet it provides for appeal to the Commission, as stated in the following paragraph, First Annual Report of the Kansas Public Utilities Commission, p. 88.

> Express provision has been made in section 33 of the public utilities law, for an appeal to this Commission by either the utility, or ten aggrieved taxpayers, in case any right, privilege or franchise granted, or ordinance, or resolution, or part of any ordinance or resolution, adopted by any municipal council or commission is unreasonable, or against public policy, or detrimental to the best interests of the city, or contrary to law.

NEW JERSEY

2—Public Service Regulation.

In the matter of the complaints against the Delaware and Atlantic Telegraph and Telephone Company, alleging unjust discrimination, unreasonable classification, and excessive rates of service. Decision of the New Jersey Board of Public Utility Commissioners, dismissing the complaints. Jan 7, 1913.

The complainant subscribers had for years received service under special contracts, embodying very low rates, when the company gave notice that these contracts would be discontinued, and service furnished at the standard rates filed with the Commission. After an exhaustive investigation of the company's service and practice, and a valuation of its entire property, the Commission finds on these two points:

129—Default in Public Service Discrimination.

> [As] to the specific issue, whether the discontinuance of the complainants' contracts worked an undue or an unjust discrimination, of which these complainants may equitably complain, our answer is in the negative. It may well be that the respondent should have eliminated all non-standard contracts simultaneously. But it can hardly be argued, that former conspicuous beneficiaries of non-

standard rates, can urge their grievance of being put on the standard schedule, and equitably ask for a restoration of their erstwhile special privileges. We do not say that the respondent is justified in a piece-meal standardization of its rates to subscribers. But those who may equitably complain of this method of standardization, are those who have been paying standard rates, not those who have been enjoying special advantages at non-standard rates. If a selective process of standardization were to be applied, it would not seem improper that the contracts farthest removed from standard be first chosen for elimination. . . .

122—Just and Reasonable Charges.

The net profits at present are clearly not excessive, but demonstrably moderate so far as this company is concerned. It follows that its rates as a whole cannot be assailed as undue or unreasonable. . . .

The opinion gives an interesting discussion of the proper base on which to allow a return, treating of land, overhead charges, paving over mains, right of way, working capital, reproduction cost and depreciation, and a careful consideration of rate of return.

The following are the most important rulings:

31—Valuation.

Granting that a public utility is entitled to a fair return on the fair value of its physical property used and useful in rendering service to the public, is such a public utility entitled, in addition, to earn a return upon an estimate of the cost of establishing their business? Second, should the reproduction cost be taken of the company's property new, or of the company's property as it now stands, somewhat aged, on the date of appraisal, as the property base on which to allow a fair return? We shall take up these two general questions separately for discussion.

It is a truism that in valuations for rate-making purposes, no simple, uniform rule applicable to all cases, exists. On the other hand the general principles which underlie all just valuations for rate-making purposes are simple. These great general underlying principles are two in number.

75—Adequacy and Efficiency of Service.

The first aims at securing for consumers generally a prompt and adequate supply at reasonable rates, of those services which they require of public utility companies. To ensure this end, a sufficient incentive must be held out to enterprisers and investors. Such an incentive is the assured prospect of a sufficient return upon outlay in supplying service. This first general principle is prospective in its reach; it looks to the future. It is comprehensive in its aim; it is bent on attaining the adequate supply of community wants.

33—Capitalization.

The second general underlying principle seeks to conserve the legitimate value of investments in public utility enterprises. It regards the past rather than the present; the individual investors, rather than the community of consumers. It is perfectly consonant with the first general principle enunciated. For unless the legitimate value of past investments is preserved by rate-making decisions, the effective incentive for individuals to take similar risks in future is impaired or extinguished.

314—Overhead Charges.

In the light of these two general principles, it appears just and reasonable, that a fair present day estimate of the capital necessarily and judiciously sunk in establishing the business, and not thereafter recouped from revenue, should enter as an element into the base upon which a fair return should be allowed. Not to include such part of the outlay or investment as is necessarily and judiciously made at the start, in canvassing for and enlisting customers, or as is necessarily and wisely incurred by reason of foregoing returns during the construction period, when money is locked up, acts to repel future enterprisers from similar ventures. Not to allow a fair return on such outlay, when made, is to extinguish in part, the value of the necessary investment requisite to afford service to the community as a whole.

The allowance on this score must, it is true, be made with circumspection. Living consumers must not be held in the power of the dead hand stretched forth from the grave of fictitious or injudicious investment.

315—Intangibles—Good Will.

Cognizance must be taken of the fact that the individual merchant ordinarily calculates his percentage of profit on his stock, not on his stock plus the good will of his business.

315—Intangibles—Going Concern.

Cognizance must be taken also, of the fact that an estimate of reproduction cost, reflects in part, the value attributed to a mechanism, whose end is assumed to be the rendering of specific services, and not to become a mere pile of potential junk.

314—Overhead Charges.

But when all is said by way of abatement or allowance, the inclusion of a proper estimate for the cost of establishing business, a cost quite distinct from the bare structural value of the apparatus, cannot be gainsaid.

32—Depreciation.

The second contention of the company relates to the company's physical property. The company has strenuously insisted that, so

far as its property is concerned, the base upon which it is entitled to a fair return, is "the reproduction value, new, of the property, not deducting anything for deterioration." . . . This raises the explicit issue whether cost of reproduction of property, should be taken as cost of reproduction of the property as brand new, or that cost diminished by an estimate for such deterioration in value, as the property has undergone at the date of the appraisal. . . .

311—Basis of Valuation.

It would appear that an allowance of replacement cost new of tangibles, as the base on which a return is to be allowed (so far as tangible property is concerned), might, in certain circumstances, be excessive. In comparison, for example, with a utility which has to-day in its plant, tangible property of a service value equal to the service value new of its original investment in tangibles, or which has accumulated a fund sufficient at any time to replace in full the expired service value of its tangibles, the utility which has done neither of these things, but simply lies under the naked obligation to make such replacements as required, is less meritorious, and is deserving of somewhat less allowance in the base for return. . . .

It would seem unfair to the company, whose tangible property shows no decline from replacement cost new, that it should be allowed a return upon the base, no greater than the base on which returns are allowed to a similar utility of equal magnitude, the service value of whose tangibles shows a shrinkage away from their replacement cost new. . . .

32—Depreciation.

Moreover, it must be added that the annual allowance for depreciation, from now on into the future, should properly be based upon the percentage estimated of reproduction cost new. . . .

It must be noted that by virtue of the now prevalent regime of regulation, with prescribed accounting provision for adequate depreciation, utilities will be regarded henceforth as coming under the requirements of continuous operation: that is to say, from now on the utilities will be expected to maintain intact, the present value of their capital investment. When, therefore, rates of depreciation are estimated in accordance with due and proper allowance therefor as provided in the statute, the sums standing to the credit of the depreciation reserve, will be deducted from the total value of assets, to ascertain theoretically the base on which utilities be entitled to a fair return. . . .

From the foregoing consideration, it appears to us that if twenty-five per cent. of the estimated replacement cost, new, of plant, except land, and of the appropriate associated plant assets, were taken to cover the entire accrued depreciation . . . the estimate would be a conservative one.

311—Basis of Valuation.

This vexed question of the proper base on which to allow a return, so far as tangible property is concerned, it is not necessary to decide in the case at bar; and we will not prematurely commit ourselves irrevocably upon this point, save that we are strongly of opinion that where the past financial history of a utility discloses the fact of an investment made unduly in advance of community needs, and thereby giving rise to depreciation uncovered, an adequate deduction therefor ought to be made. This amounts to what in essence is a corporate deficit, which should be distinguished from unearned depreciation, deserving of ultimate recognition and incorporation in the property base on which to predicate just earnings in future. . . .

Other things equal, a fair base on which to compute a return for a public utility, seems to be the present value of the investment.

34—Rate of Return.

A return of 8 per cent. on the fair value of the company's investments seems to us fairly equitable, when consideration of all conditions is taken. Especially as this return is to cover all such items as bond discount, brokerage or other costs of obtaining capital. The technical apparatus is still in process of change. The proper allowances for depreciations are still, of necessity, largely conjectural. Moreover, so far as this particular company is concerned, brisk competition is still offered in many parts of its territory. . . .

NEW JERSEY

626—Street Lighting.

Complaint of Raritan Township Against the Public Service Electric Corporation, charging that the street lighting rates proposed in a new schedule were excessive and discriminatory. Decision of the New Jersey Board of Public Utility Commissioners, dismissing the complaint. Electrical Review, March 15, 1913, p. 562.

619—Rate Differentials.

The board after a thorough investigation finds that the new schedule of rates submitted shows a total net decrease of $100,200.98. While increases are made in the charges to some of the municipalities served, the total of these increases is small, as compared with the total reductions. These increases are not therefore deemed sufficient cause for setting aside the schedule, which will not, as a whole, bring to the company an unreasonable return on a reasonable or legitimate investment. The investment cost of conduits and pole line which should be allowed to street-lighting service, produces a lower average cost per lamp for a municipality with a large number of lamps, as compared with a municipality having a smaller number. A sliding schedule granting lower rates for larger installations, is not

unduly discriminatory or preferential, but a uniform price to all municipalities, irrespective of the number of lamps, and without reference to terms of the contract, would be unduly discriminatory.

283— **COMMISSION REPORTS**

First Report of the Public Utilities Commission of Kansas, May 22, 1911, to November 30, 1912. 135 pages.

This gives a general report of the work of the various departments of the Commission, including the appraisal of railroad property in the state, which, it is reported, is being prosecuted with vigor. Tables of such valuation of the Union Pacific Railroad Company by sections, are given. The important decisions with rulings of interest to electric light companies, are to be found on pages 86 to 106, and include full reports of the Parsons rate case, abstracted in 2 R. R. 348; The Wyandotte County Gas Rate case, 2 R. R. 295; and the Garden City Electric rate case, briefly abstracted in 2 R. R., 393.

THE MODEL PUBLIC UTILITY LAW

The Model Utility Bill prepared by the committee of the Department on Regulation of Utilities, of the National Civic Federation, has not been available to companies. The Rate Research Committee has now obtained permission from the Federation, and has printed a limited number of copies, which can be supplied at $1 each, the cost of the printing, upon application to the Secretary of the Rate Research Committee. The bill has not yet been formally approved by the National Civic Federation, but as it is being used by those who are drafting and amending legislation concerning public utilities, as a good guide in formulating such measures, it should be in the hands of all the companies interested in public service regulation.

REFERENCES

RATES

62—Character of Service.

Ice Making for Central Stations, editorial, Electrical World, March 1, 1913, p. 433.

Points out how the combination ice-electric plant utilizes the waste products, and hours of light load of the electric plant, for the manufacture of a very profitable by-product. The ice business shares the burden of operating, labor, office, real-estate, plant investment and insurance costs, lowering the cost of electricity, and making cheap ice. One set of employes and office help can handle both businesses, keeping themselves useful all the year round, so that there need be no lay-offs. In point of economy no mere ice plant can ever begin to compete with the central station which is turning out ice and electricity with a single set of plant costs.

62—Character of Service.

Electricity in Carriage and Wagon Works, illustrated article. Electrical Review, 5 2-3 pages, March 15, 1913, p. 543.

This article discusses the advantages of motor drive, giving figures on the economy of central-station power, and presents data on several typical installations. No better illustrations can be given of the advantages and economies of electric drive, than in cases where it forces competing motive powers out of business, in the face of unusually low fuel costs, and a full report of costs of operation by central-station power in a representative wagon factory is given, showing lower operating cost per year than the original steam plant, even when refuse sawdust and shaving had been burned under the boilers.

626—Street Lighting.

Lighting Streets by Electricity — Relative Merits of Arc and Incandescent Lamps, by Harold Lasker, Electrical Record, 4 pages, March, 1913, p. 43.

This is an abstract of the essay which has been awarded the Stillman Prize of Applied Technology, in Stevens Institute. It is a study which includes a brief sketch of the development of electric street lighting, the economic elements, all the factors relating to efficiency, glare, color, distribution, ornamental effects; with tables of comparative total costs and efficiencies of the various types of incandescent and arc lamps, the costs being computed under (a) fixed charges, (b) maintenance charges, and (c) energy charge.

41—Terminology.

The Dewey Decimal System of Classification Extended to Engineering, editorial, 1¼ pages, Engineering News, March 13, 1913, p. 537.

This is a criticism of the Dewey decimal system of classification, and states that though many engineers and manufacturing firms have already adopted the Dewey decimal system, or a similar one, for classifying, indexing and filing current technical articles, trade catalogs, etc., and its advantages over any irregular, haphazard system are undoubtedly very great, yet the difficulties of mastering it sufficiently to use it for practical engineering purposes, are such as to make it doubtful whether any others than professional librarians will appreciate its value.

INVESTMENT AND RETURN

31—Valuation.

Views on Railway Valuation, abstract of discussion by the National Association of Railway Commissioners, 1912 Convention, Washington, D. C. Public Service Regulation, 2 pages, March, 1913, p. 109, and Railway Valuation Act, p. 111.

This brief summary of the opinions of some of the leading Public Service Commissioners, shows the main trend of thought on the general subject of valuations of public utilities, and includes considerations of physical inventories, original cost or investment, present day value, depreciation and appreciation.

The complete text of the new federal railway valuation law, abstracted in 2 R. R. 388, is given as above.

32—Depreciation.

Depreciation as Affecting the Value of Tangible Property Devoted to Public Use, memorandum for Company, John J. Crennan, Attorney for Westchester Lighting Company, Louis L. G. Benedict of Counsel, in the complaints before the Public Service Commission

(N. Y. 2nd D.) as to the reasonableness of gas and electric rates, 35 pages.

This is an argument for reproduction cost new, without deduction for depreciation, as the fair value on which a public utility should be allowed to earn, saying that the proposition is most simply and clearly shown by considering the case of a man purchasing a machine, who will assume that, for the equal service which the machine renders throughout its life, he will be entitled to equal pay, and will not assume that, the services remaining unimpaired, there will be any reduction of rates merely because the machine is one year older than it was the year before; and states that a depreciation fund does not change the situation, because earnings and profits derived from investment of the accumulated reserve fund are carried in the fund, and are not applicable to any surplus available for dividends.

PUBLIC SERVICE REGULATION

BOOK REVIEW

2—Public Service Regulation.

REGULATION, VALUATION AND DEPRECIATION OF PUBLIC UTILITIES, by SAMUEL S. WYER, M. E., published by the Sears and Simpson Co., Columbus, Ohio, $5.00 net.

This is the best book that has yet been published upon the general subject of public service regulation, and the form of the book has been carefully worked out so that it is unusually satisfactory as a reference book. The typographic work is excellent, and the book is printed on India paper with limp leather cover, so that its 312 pages give a book which is only three-eighths of an inch in thickness. This has a great many advantages, but it may work to the disadvantage of the book, as it is perhaps not so impressive as the ordinary text book of 300 pages on standard paper. The absence of the title on the back of the book may also work to the disadvantage of the book, when placed in a library.

The arrangement of the book is carefully thought out, and the cuts and diagrams are clear and well done. Each chapter is carefully analyzed, often by a diagram, and each paragraph is clearly explained by court and other authoritative reference. There is some danger, however, in the author's method of selecting the typical reference covering the specific paragraphs, as, while these references are in general selected with great care, and represent the best opinion upon the subject, only one side is given, and this may subject the book to criticism from sources not altogether friendly with the viewpoint of the author.

The book is particularly strong in its definitions of all matters pertaining to utility regulation, and the reference data, selected bibliography, and exhaustive index increase the value of the book as a reference work. All quotations and references are given by number referring to the special chapter, Selected Bibliography.

On the whole the book is an exceedingly important reference work, and will make a valuable addition to engineering libraries, and will be useful to those who wish to study the regulation problems of today in a logical manner.

14—Relations of Corporations With Each Other.

California Ruling on Union Pacific — Southern Pacific Unmerging, by John M. Eshleman, President of the California Railroad Commission, Public Service Regulation, 2¼ pages, March, 1913, p. 123.

This gives a concise abstract and review of the decision of the California Railroad Commission on the Union Pacific—Southern Pacific separation, and shows that the Commission did not originally rule that the Southern Pacific should accord the use of any of its facilities to any other carrier, but holding that compliance with the mandate of the supreme court of the United States, which requires actual competition to be brought about between the Southern and the Union Pacific, must be insisted upon, it therefore, while recognizing the right of a carrier to exclude from the use of its own property, another carrier, ruled that the preferences and privileges sought to be granted by the Southern to the Union Pacific, must be accorded to the Western Pacific as well. The decision was not, therefore, that the Western Pacific should be admitted to any privileges upon the lines of the Southern Pacific, but that if the Southern Pacific voluntarily admits its competitor, the Union Pacific, it cannot in justice, deny a like privilege to the Western Pacific or any other competing line similarly situated.

2—Public Service Regulation.

The Functions of a Technical Staff in Public Utility Regulation, by W. D. Pence, Chief Engineer, Wisconsin Railroad Commission, a paper read before the Indiana Sanitary and Water Supply Association at Indianapolis, Feb. 26. Electrical World, March 8, 1913, p. 489.

This is a brief abstract of the very interesting paper of Professor Pence, which gave a history of the work and methods of the technical staff of the Wisconsin Railroad Commission, from the earliest established engineering staff, which under the law of 1903, made the initial appraisals of steam roads in that state, to the present time, there having been no break in the continuity of the staff and its work of valuations, although several more or less radical changes in organization have been made to meet changed requirements of the new legislation.

The detailed classification of the various items of physical property, which is used by the commission in handling appraisals, is given, and its policy of granting fair treatment and encouragement to public utilities in carrying out the regulations and requirements imposed, is shown to have produced good results in the four years and more of its labors.

GENERAL

83—Municipal Ownership.

Municipal Ownership of Public Utilities, a paper by E. M. Bassett, formerly Public Service Commissioner, N. Y. 1st D., read at the Schenectady meeting of the Eastern New York National Electric Light Association, 1913.

This gives a most interesting review of municipal ownership and operation of public utilities, mainly in Germany, where this method, owing to special favorable conditions there, is very satisfactory; briefly touching upon England and France where it is extending, and coming to United States, shows that it has not as yet been successful here, and no greater mistake can be made than for a community that is unable to keep competent and honest officials in office for considerable periods of time, to embark in widespread municipal business.

Public service regulation is at present our best policy, and there can be no doubt that it has stayed the premature adoption of state and municipal ownership and operation. In this respect it has undoubtedly been a blessing, because no community can afford to take up suddenly, the intricate business that would devolve upon it in connection with the detailed management of all public utilities. It is likely that for a considerable time state regulation will grow less inquisitorial as to specific cases, and more automatic, as for instance, in the adoption of the sliding scale, which has met with general favor in England. This is a method of allowing an increase of dividend if and when there is a decrease in rate. The customary provision is that the dividend may be increased ¼% for every one penny decrease in the price of gas. These and other prescribed methods, make for automatic regulation of public utilities, and have many advantages over a system of public regulation that depends on constant inquisitorial processes and issuing diverse and intricate orders.

91—Promotion and Growth of the Business.

PREPARING FOR ELECTRIFICATION OF STEAM ROADS, editorial, Electric Railway Journal, March 8, 1913, p. 405; and editorial and article, Electrical World, March 8, 1913, p. 481 and p. 484.

The management of the Pennsylvania Railroad having made its plans for electrification of its line from New York to Washington, D. C., realizes that, in addition to the elementary needs arising out of the many present applications of electricity, it will soon be necessary for its trainmen and shopmen to be equipped for the operation of an electrified system, and has established a correspondence school of electricity. The men themselves have been so quick to see the point, that within thirty days of the announcement that the school would be started 10,000 Pennsylvania employes, representing almost every department, have enrolled as electrical students. This carries a suggestion worthy of consideration of the officials of street and interurban electric railways.

91—Promotion and Growth of the Business.

ENGINEERING REPORTS ON ISOLATED PLANTS, by A. S. WITMER, Electrical Review, 1 1-3 pages, March 15, 1913, p. 549.

This states that if central stations are to maintain their rapid rate of growth of the past decade, they must make active campaigns to sell power to factories, and be able to prove the economies of wholesale purchased power to the man who needs steam in his factory; the man who has a large area requiring heat six months or more in the year; the factory that produces a by-product that makes good fuel; the man that sells a little light and power to his neighbors; and, most difficult of all, the man who has just recently installed a new plant.

This can best be done by presenting to the factory manager or owner a carefully compiled engineering report, containing only facts, and no undue prejudice in favor of central-station power, but made valuable by suggestions for improving operating conditions, by which the unit cost of production can be reduced. A synopsis is given of such a report, detailing all the subjects, properly classified, which should receive attention, and the large number of items affecting the relative costs, convenience, security, etc., of operation by purchased power as compared with the isolated plant, which the present thorough study has brought out,

as well as their excellent arrangement as here presented, will form a most efficient help to any central-station manager in this important part of the work of extending his business.

95—Progress in the Art.

Sources of Energy Available for Power, by H. S. Hele-shaw, the Electrician (London), 2¼ pages, October 25, 1912, p. 90.

This paper gives a summary of the various sources of energy available for power generation, particularly the coal supply, petroleum and petrol, water and wind power, heat derived from the earth itself, and radium. It points out that of these, the coal supply is the one on which we must mainly rely, and puts forward a plea for the cessation of the present recklessness in its employment.

Assuming the present rate of output of mines to be maintained, the coal resources in the United Kingdom would last more than 400 years. Some conclusions as to possible and desirable economies are stated.

96—Co-Operation.

Selling Energy to Municipal Electric Plants, editorial, Electrical Review, March 15, 1913, p. 539.

States that the development of hydroelectric transmission systems in well populated regions, often encounters the established municipal plant in its progress, and the problem of entering into mutually profitable relations in such cases is one of no small importance, and is especially advantageous when agreements are made by which the municipal station is held by the transmission line as an auxiliary. A typical instance under negotiation at this writing, is that of a generating plant of a manufacturing town of about 12,000 inhabitants in which, with a coal cost of $3.82 per ton, the manager figures the total cost of production for the past year at 3.8 cents per kilowatt-hour, including operating expenses and distribution costs at about 2.2 cents, interest at 4 per cent and depreciation at 5 per cent. The hydroelectric company offers to furnish the town with electrical energy at a price close to two cents per kilowatt-hour, the municipal plant to be held as an auxiliary at the expense of the company, for a contract period of ten years. It means a saving to the town of approximately $1,000 a month. This suggests the wisdom of genuine co-operation where margins are narrow, and costs are closely figured.

96—Co-Operation.

A Modern Power Network, the Waterbury-New Britain System, by Charles Rufus Harte, abstract of paper read before the Connecticut Society of Civil Engineers, New Haven, Feb. 12, 1913. Illustrated article, and editorial, Electric Railway Journal, 3¼ pages, March 1, 1913, p. 356 and p. 366.

The article gives a description, with illustrations, map and diagram of the Waterbury-New Britain power generating, and transmission system, which is a combination of three hydro-electric and two steam-electric plants with a total output of 26,200 kilowatts. Energy is transmitted at 11,000 volts and 33,000 volts, to be converted at substations for use on both A. C. and D. C. circuits.

The editorial comment notices the great economy and mutual advantages to be gained by companies forming such a network, which were first established on the Pacific Coast, and states that this New England system which stretches out branches in various directions, with its five stations, two steam and three hydraulic, works together for mutual service, although the Hartford plant is quite distinct from the Waterbury-New Britain plant, except as the two are tied together as a matter of convenience. The very fact that this interconnection has been made, however, adds materially to the usefulness of both systems. It is not in the least necessary that plants should be solemnly merged in order that they may gain most of the material advantages of union. A working agreement for the interchange of power is, so far as the public is concerned, just as valuable as joint ownership and is often to be preferred.

Rate Research

Vol. 2 CHICAGO, MARCH 26, 1913 No. 26

For statement of facts and opinions contained in papers abstracted herein, the Association does not hold itself responsible

RATE RESEARCH CLASSIFICATION

In the first printed issue of RATE RESEARCH was given a tentative classification or outline (see page 10). It was pointed out at that time that the tentative classification would be developed, along the lines of the committee's work, both as a method for complete reference to rate data, and as a proper indication of the general scope of the information to be covered by RATE RESEARCH.

Considerable rearrangement has been necessary, but in the main, the classification as originally outlined has been preserved, and in presenting in this issue the revised classification and index of Volume 2 of RATE RESEARCH, the classification has been used as the basis for a subject index.

In addition to this classification and subject index, is given the usual alphabetical index to both the titles of articles, and to the authors of papers included.

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